

Corporate Philanthropy Practices in K-12 Education in the U.S. and Germany: Are they Converging in STEM and MINT Education?



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Abstract (English)

Corporate philanthropy is active in K-12 education in Germany and the U.S. but there is minimal research about it. Over the last decade corporate philanthropic actors in both countries have become active in STEM* education (in Germany, MINT). This comparative study is about why and how they decided to invest in these initiatives and how that is tied to their traditional roles in education. It leans on the history of company involvement in education since 1945 and on interviews with experts active in the STEM and MINT education scenes.

The main findings are: (1) As a result of the PISA shock and other factors, German companies that traditionally engaged only in vocational education have become active in general K-12 education. (2) Corporate philanthropy led the STEM and MINT education movements. However, U.S. companies and their foundations, with decades of philanthropic experiences and networks in education, were more successful in raising awareness, organizing resources, and achieving policy changes at the federal level. (3) Companies and their foundations were driven to invest in STEM and MINT education largely by workforce, long-term innovation, and economic concerns but there were key differences because of the differing demographic and education trends in the two countries. (4) In the U.S. and Germany, corporate philanthropy is attempting to be more strategic. This has resulted in a focus on outcome-based measurements and scalability but has also led to more investments in nonprofit and policy organizations instead of schools or their booster clubs. It has also resulted in corporate philanthropy better aligning with company competencies and needs, which made STEM and MINT ideal. In the case of the U.S., this has also resulted in some companies creating vocational programs, an area of education most companies avoided in the past.

*STEM= Science, Technology, Engineering, and Math

MINT= Mathematik, Informatik, Naturwissenschaften und Technik

Keywords: corporate philanthropy, STEM education, MINT education, policy paradigm, institutional entrepreneurs, path dependency, competitive advantage philanthropy, vocational education

Abstract (Deutsch)

In Deutschland und den USA engagiert sich die unternehmerische Philanthropie zunehmend in der Allgemeinbildung, während der letzten Dekade vor allem in den „MINT“ Fächern (Deutschland) und den „STEM“ Fächern (USA). Hierzu gibt es bisher kaum systematische Studien. Diese vergleichende Arbeit untersucht, warum und wie sich Unternehmen in diesen Bereichen engagieren, und wie sich ihre Rolle in der Bildung verändert. Die Studie beruht auf einer historischen Analyse der Rolle von Unternehmen in der Bildung seit 1945 und auf Interviews mit Experten aus dem MINT- und STEM-Bereich.

Die wichtigsten Befunde der Studie sind: (1) Zuvor überwiegend in der dualen Bildung aktiv, begannen deutsche Unternehmen in den frühen 2000er Jahren u.a. als Reaktion auf den PISA-Schock, sich philanthropisch in der allgemeinen Schulbildung zu engagieren. (2) Unternehmerische Philanthropie führten die MINT und STEM Bildungsbewegung an. Aufgrund ihrer etablierten, gut vernetzten und vielfach finanzkräftigeren Stiftungen gelang es US-amerikanischen Unternehmen besser als deutschen, das Thema in das öffentliche Bewusstsein zu rücken, Ressourcen zu erschließen und Änderungen in der Bildungspolitik auf föderaler Ebene zu erwirken. (3) Unternehmen und deren Stiftungen wurden in erster Linie durch Entwicklungen auf dem Arbeitsmarkt, langfristige ökonomische Überlegungen und die Notwendigkeit zur Innovation motiviert, sich in MINT beziehungsweise STEM zu engagieren; aufgrund unterschiedlicher demographischer Aspekte und unterschiedlicher Entwicklungen in der Bildung fanden sich deutliche Unterschiede zwischen den beiden Länder (4) In Deutschland und den USA agiert die unternehmerische Philanthropie zunehmend strategisch, d.h. sie handelt ergebnisorientiert und achtet auf Skalierbarkeit ihrer Aktivitäten. Dies hat zwar insgesamt zu einem zunehmenden Engagement von Unternehmen in der Bildungspolitik geführt, jedoch weniger in Schulen und deren Fördervereinen. Die unternehmerische Philanthropie richtet ihr Engagement zunehmend an den Kompetenzen und wirtschaftlichen Bedürfnissen von Unternehmen aus. Manche US-amerikanische Unternehmen haben daher begonnen, Berufsbildungswege zu schaffen, was bisher im Gegensatz zu Deutschland dort nicht die Regel war.

Keywords: unternehmerische Philanthropy, STEM Bildung, MINT Bildung, Policy Paradigm, Pfad Abhängigkeit, beruflich Bildung

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I am of course thankful for many other academics and scholars who I have met along the way. Professor Dr. Nina Kolleck, whom I met early on, was quite helpful in encouraging me to continue this work and by being on my committee along with Professor Dr. Thomas Koinzer. Thank you both for being willing to give so much of your time and attention to my dissertation. A special thank you goes to Professor Dr. Marcelo Caruso who graciously agreed to take me on at Humboldt when I first arrived in Germany and had a rough idea of what I wanted to work on. Without your initial kindness I am not sure I would have ever gotten this far (my historical chapter is also a shout out to the great work you do). To the many other academics who work on issues on the intersection of philanthropy and education, I thank you for your time, our many discussions, and for sharing interesting articles with me or inviting me to events of interest. I think especially of Dr. Clemens Striebing, Janina Mangold, Dr. Ekkehard Thümler, Professor Dr. Thomas Höhne, Dr. Sigrid Hartong, Simon Morris-Lange and embarrassingly, I probably forgot a few.

I am also grateful to my interviewees who will remain anonymous as promised. Each one of them took time out of their busy lives to meet with me, an odd PhD student who wanted to learn more about the STEM and MINT movements and their role in it. Your willingness to do so is a reminder of the importance of making ourselves available to further scientific study. Thank you!

I was not alone at home either. I am thankful for the support of my husband, Daniel and for all of the fun breaks Jakob and Johanna provided. Thanks for adding spice and spark to my life and for encouraging me (in your own ways) to complete this.

Forward

After six years of being in the classroom, I headed to Washington to work for an education policy think tank. During my time there I went to numerous meetings about the need to improve K-12 education and possible ways to do so. When one works in education policy, that is pretty much what one expects. What came as a bigger surprise to me was how often business groups such as the Business Roundtable or the U.S. Chamber of Commerce were also playing a leading role in these meetings. There were often people from foundations at these gatherings. This was less of a surprise given that education is the top area of investment among American foundations but there were also many people from corporate foundations.

I observed the exact same type of involvement when I was working on state education policy in Connecticut. I noticed that some companies and their foundations often had a front seat in education policy debates. They were considered by many to be a very valued and legitimate voice because of their role as the ultimate consumer of the education system. While this seemed completely reasonable to me, it did make me wonder if corporations and their foundations were this active in the general K-12 education policy in other countries and if so, what they were focused on and how they were engaged.

In 2012 the chance to find out presented itself. I moved to Germany where I started to work on my PhD and decided to take the question of the role of companies in K-12 education further. Germany was an ideal country for me to study not just because I happened to be living there and was learning the language but because of the structure of its education system, many recent education reforms, its large and growing philanthropic sector, and its successful industry sector. All of these elements played were instrumental in my comparative research of the role of corporate philanthropy in education.

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Shana Kennedy-Salchow

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Chapter 1: Introduction and Overview

“Innovation and growth in Germany depend to a great extent on the MINT competencies of dedicated skilled workers and highly qualified employees.”

Dr. Angela Merkel, 2009¹

“Reaffirming and strengthening America’s role as the world’s engine of scientific discovery and technological innovation is essential to meeting the challenges of this century. That’s why I am committed to making the improvement of STEM education over the next decade a national priority.”

Barrack Obama, 2009²

Reading either one of those quotes by themselves, most people would likely nod in agreement. STEM refers to Science, Technology, Engineering, and Math and MINT refers to for Mathematik, Informatik, Naturwissenschaften, and Technik. After all, who could be against kids doing better in math, science, and technology? They are the must-have skills and knowledge of the current and future economy, right? While I am certainly not against improving education in those areas, it is worth unpacking and comparing how four-letter acronyms on both sides of the Atlantic came to be prominent in education policy circles. It is also important to uncover the roles companies have played in elevating STEM and MINT education.

I came to this topic after comparing the philanthropic giving of top companies in both countries (see Methodology). I noticed that many of them were active in STEM and MINT education. The more I delved into the topic of STEM education in the U.S., the more I started to wonder why and how STEM had become a huge buzzword (or buzzacronym to be exact) in K-12 education and economic circles. I started to notice the many organizations operating at the federal, state, or local level with the goal of improving the quality of STEM education and their calls to do something about the shortage of STEM skills and knowledge. I also started to pay more attention to the

¹ In German: Denn Innovation und Wachstum in Deutschland hängen maßgebend von den MINT-Kompetenzen engagierter Fachkräfte und Hochqualifizierter ab. From MINT Zukunft Schaffen (2009b).

² From Obama (2013).

many companies and business organizations that were active in STEM education through their philanthropy and by lending their voices to the movement.

I noticed the same in Germany where MINT is the buzzacronym of choice and likewise, companies and their foundations are quite active. Similarly, the argument is that more people with expertise in these subject areas are needed to keep Germany's economy strong and competitive. Likewise, there are many organizations that support MINT education at the local, state, and federal levels. The more I read, the more striking it became that although there is significant corporate philanthropic interest and involvement in STEM and MINT education in both countries, there is a lack of research about it.

It became even more striking as I read the debates about the STEM education movement in the U.S. Some argue that a dearth of STEM graduates was causing detrimental harm to industry; which would only get worse and ultimately lead to the demise of America's competitiveness (Change the Equation, 2016; Committee on Prospering in the Global Economy of the 21st Century, 2007). Others however argue that there is no lack of STEM graduates in the U.S. They argue that there is a glut of graduates and foreign workers in these fields. This makes it difficult to find jobs in the STEM fields so graduates pursue other opportunities or are unemployed. According to them, the current STEM education focus is leading far too many young people down career paths that lead to a dead end. In effect, they proclaim the STEM crisis a myth (see for example: Charette, 2013; Teitelbaum, 2014b).

Some have argued that the real shortage is not at the advanced degree level but at the middle-skills level and that this is where the focus should be (see for example: Carnevale, Smith, & Melton, 2011; Rothwell, 2013). Others argue that the need for improved STEM skills is not about labor force shortages but about STEM literacy. With the sheer amount of technology and information in our lives, all students need a solid foundation in these subjects (Charette, 2013). Making this debate even more difficult is the lack of a definition of a STEM job. The percent of jobs in the economy related to STEM is estimated to be between five and twenty percent depending on the source and the definition (Carnevale, Smith, et al., 2011, p. 1; Charette, 2013; Rothwell, 2013, pp. 2-3).

Research Questions

This research does not specifically address this debate of actual labor market need but seeks to answer why and how corporate philanthropy became involved in STEM and MINT education in the two countries. To understand the rise of these buzzwords in education, my research examines three main dimensions from the late 1940s through the 2000s. One dimension is the role of business in education from both a vocational perspective but also from a philanthropic and societal perspective. STEM and MINT education are examples of industry involvement in education but they build off of long histories. Companies active in education do not exist in a vacuum so the second dimension explores the ideas and events in general K-12³ and vocational education that likely impacted companies. Also, because large companies are often involved in education through their philanthropy, the third dimension includes the trends and happenings of philanthropy and corporate philanthropy in the U.S. and Germany over time. An historical analysis of these three dimensions is necessary to answer the sub question of how past corporate vocational or philanthropic involvement in education has influenced recent philanthropic decisions.

Building off past involvement will help towards a better understanding of current corporate philanthropic education initiatives but a much deeper exploration of recent happenings and involvement in education is needed to answer my two other sub-questions of: Why is STEM and MINT education of interest for corporate philanthropic actors? And, how has corporate philanthropy elevated STEM and MINT to major education policy issues?

Theoretical Basis and Findings

Leaning heavily on historical institutionalism, the educational involvement of companies and their foundations in Germany and the U.S. is evaluated. This line of institutionalism defines institutions to include formal and informal rules and practices that influence conduct. In general it is most interested in the state and societal institutions that shape how actors define their interests and interact with other actors.

³ K-12 education refers to kindergarten through grade 12 education from an American perspective but can be equated with Elementary and Secondary Education or in the German case, allgemeine Bildung but for purposes of brevity, it will be referred to as K-12.

The historical institutionalist perspective allows for a richer analysis of institutional, political, and cultural factors as it allows for the identification of key events and changes overtime. It lends itself well to comparing public policy with an emphasis on the impact of national political institutions on relations between other actors (Hall & Taylor, 1996, p. 938; Thelen & Steinmo, 1992, p. 2).

Path dependency theory is a common strand in historical institutionalism. As Bernhard Ebbinghaus (2009), argues path dependence theories have become synonymous with showing how the past matters in shaping the future. Encompassed within in these theories are actually two different categories of path dependence. Of interest for this research are the critical juncture models where collective actors decide to take one pathway over other possible paths. Companies have long been active in public education, however, the reporting of results required under No Child Left Behind Act (NCLB) in the U.S. may have been a critical juncture (potential turning point) for their involvement in education. The same could be true for the Programme for International Student Assessment (PISA) results in Germany. The question here is did these events cause companies and their foundations to alter their approaches to education?

Whether or not a critical juncture happened, it is important to understand how corporate philanthropic involvement in education changed after the early 2000s. Incremental changes lead to “gradual transformation.” This can happen through several processes but of most interest here are the displacement and layering processes. In a displacement process, a subordinate institution starts to have inroads through the active cultivation of a new logic inside an institution. In a layering process, new elements are layered on an existing institution and eventually the new fringe starts to take away from the core of the institution (Streeck & Thelen, 2005). In this sense, how did companies change the way they interacted with educational institutions over time?

When analyzing the processes of gradual transformation, the ideas that fueled them need to be evaluated. One type of idea is a “policy paradigm,” which results when most actors have adopted a common definition of a problem and it is tough to argue with. It changes the way the actors view the world (for more on ideation, see: Béland,

2007; for definition see: Hall, 1993, p. 279; Mehta, 2013, pp. 18-23). I argue that both STEM and MINT are forms of what I refer to as sub-policy paradigms. They are spinoffs of other paradigms but corporate philanthropy helped create the new movements, resulting in many of the same elements of a policy paradigm. In essence, the corporate philanthropic actors did not completely change their stance towards education reform and policy but they chose to narrow their efforts on the STEM or MINT areas of it.

Based on Daigneault (2015), a sub-policy paradigm includes: (1) An assumed problem definition with minimal dissent. The question is not “do we need more or better STEM and MINT education” but “how do we best go about fixing it?” (2) There is a belief among corporate philanthropic actors and others that improving STEM and MINT education needs public intervention to propel it forward. (3) There is agreement among education policy actors regarding the education policy goals that are appropriate. (4) There are shared ideas about how to achieve the goals of more and better STEM and MINT education.

It is also important to analyze where ideas actually come from and the factors or perceptions that drive actors (Berman, 2013; Hay, 2011, pp. 72-74). For this reason, the ideas about education, innovation, and the workforce but also ideas about best practices in philanthropy and legitimacy are also taken into account. The STEM and MINT movements look quite similar from the outside but a comparison of the influencers of ideas allows for key cultural differences to emerge.

Beyond the development of ideas, it is also important to understand how corporate philanthropic actors in both countries worked with other actors to change the education landscape. Here the concept of corporate foundations as institutional entrepreneurs is applied, consistent with Paul DiMaggio's description that "new institutions arise when organized actors with sufficient resources (*institutional entrepreneurs*) see in them an opportunity to realize interests that they highly value" (DiMaggio, 1988, p. 14). Other scholars have also used this theoretical basis when explaining the philanthropic behavior of foundations in education (see for example: Quinn, Tompkins-Stange, & Meyerson, 2013; Thümler, 2014) but the focus

here is on the philanthropic engagement of the top companies in MINT or STEM education initiatives.

Regardless of the mechanisms of change for the role of corporate philanthropy in education, it is important to measure what actually changed. The presence of a critical juncture, a policy paradigm, or the evidence of institutional entrepreneurship only matters when the impact can be shown. For corporate philanthropy's involvement in K-12 education in Germany and the U.S., the comparisons of how each of these mechanisms played out show that institutional change is bound by historical paths and current ideas. All of which, can yield completely different results.

The main findings are: (1) Starting in the 2000's, as a result of the PISA shock and other factors, German companies that traditionally engaged only in vocational education have become active philanthropically in general K-12 education issues. (2) Corporate philanthropy led the STEM and MINT education movements. U.S. companies and their foundations, with decades of philanthropic experiences and networks in education, were more successful in raising awareness of the issue, organizing resources, and achieving policy changes at the federal level. (3) Companies and their foundations were driven to invest in STEM and MINT education largely by workforce, long-term innovation, and economic concerns. In Germany the focus was more on the workforce overall because of a dwindling youth population and their changing educational preferences. In the U.S., interest was driven more by concerns about a lack of diversity in the STEM workforce and the long-term consequences. (4) In the U.S. and Germany, corporate philanthropy is attempting to be more strategic. This has resulted in a focus on outcome-based measurements and scalability but has also led to more investments in nonprofit and policy organizations and less going to schools or their booster clubs. It has also resulted in corporate philanthropy better aligning investments with company competencies and needs, which made STEM and MINT ideal. In the case of the U.S., this has also resulted in some companies creating vocational programs, an area of education most companies avoided in the past.

Why the U.S. and Germany?

For a comparative study of the role of corporate philanthropy in K-12 education, the U.S. and Germany were ideal countries from the perspective of their education systems and governance, the presence of large, globally recognized companies, and their active philanthropic communities.

From a large company perspective, of the 500 companies with the highest revenues in the world, 132 companies are based in the U.S. and 32 are in Germany. In the rankings, the U.S. is first and Germany is tied with France for fourth place for having the highest number of Global Fortune 500 companies (For company information see: Fortune Magazine, 2012c). In between are China and Japan with much stronger national control over education, making the comparison of education policy influences more difficult to analyze.

With respect to foundations, the U.S. has the largest foundation sector in the world, while Germany has the second largest (see for example: Anheier, Förster, Mangold, & Striebing, 2017, p. IX). Both countries have also had enormous growth in philanthropic initiatives in education over the last two decades (see below). The comparison is especially interesting because of the very different roles companies have played in K-12 education over the years.

K-12 Education in the U.S. and Germany and the Role of Companies

Educational governance in the U.S. and Germany are quite similar because the federal government has a limited role in education. Instead the governance of education is delegated to the states (or in Germany, the Länder). Education is not explicitly mentioned in the U.S. Constitution and Basic German Law does not give the federal government legislative power for it (KMK, 2011, pp. 16, 23, 34-35, 45, 50-53, 55, 183, 225; U.S. Network for Education Information, 2008). The federalist structure of governance of education in Germany and the U.S. makes it easier to compare education governance issues in the two countries.⁴

⁴ It should be noted however, that there are additional policy-making layers in the U.S. at the state government level with state boards of education and at the local level with local boards of education. In the U.S., the control and actual administration of primary and secondary

Although education is a state-level responsibility in both countries, I have focused on the federal level because a comparison of all 50 states of the U.S. and all 16 in Germany would have been extremely complicated from a comparative perspective. Also, as Höhne and Schreck (2009) have pointed out, there is an increase of governance activity at the regional level in education. This new sub-level of governance has opened the door for networks of elite actors including local companies and foundations to be more active in education (pp. 111-114). As of 2014, Germany had 56 MINT Regions (Mayer, André, & Nöthen, 2014, p. 1) and with the amount of local control activities in the U.S., a comparison all of the activities at the regional and local levels would be close to impossible. Furthermore, even though the federal government in Germany contributes minimally to K-12 education, it can play a large role in the public debates about education and in emphasizing specific education themes (Hepp, 2011, p. 135). The same can be said for the federal government in the U.S., where its role in education has grown considerably in the last two decades (Carr, 2012, pp. 4-5).

Elementary and secondary education, referred to as K-12 education is the focus of this research for two reasons. First, in both countries there are compulsory education laws (Schulpflicht) that stipulate that all children between specific ages must be educated. From a practical standpoint, this also means that K-12 education policy affects almost all students. Some exceptions may include private school students but there are many policies that apply to them and they are also heavily influenced by what happens in the public education sector. Secondly, the very different structures of secondary education and the traditions of vocational education in K-12 education lend themselves well to a comparison of the evolution of company involvement in the U.S. and Germany.

In the U.S., the comprehensive high school has long been the prevalent model of secondary school. In this model, usually starting at grade nine and ending in grade 12, students of all abilities and aspirations attend the same type of secondary school. At

education is more concentrated at the local level than in Germany where these aspects of governance are usually at the state level (U.S. Network for Education Information, 2008).

the end, they get a high school diploma. Although all students may physically be in the same building, they are often tracked by ability within the school, which many researchers argue has led to large inequalities of educational opportunities (see for example: Grubb & Lazerson, 2007, pp. 40-43; Hess, 2010, pp. 107-111, 119-120; Meyer, 2011). In Germany; however, students have traditionally been separated into three distinct secondary school experiences, starting as early as grade five. This tripartite system consists of the Gymnasium for those considered to be the most academically inclined, the Realschule for those likely to pursue a more technical career, and the Hauptschule for the working class. Across the German states, there have been many changes to the traditional school structure with many states adopting some form of an integrated secondary school that offers more flexibility in attaining educational credentials (see for example: Baumert, Cortina, & Leschinsky, 2003, pp. 52-73; Meyer, 2011; Nikolai & West, 2013). The shifts in the types of secondary schools students are attending have also impacted a major institution in German training, namely, the dual vocational training system.

Companies in the U.S. play a minimal role in the actual provision of vocational training. The U.S. is considered to have a “liberal skill formation” system where skill training happens via markets and in the general education system, which typically does not have strong links to employers (See Table 1.1). Students usually receive a general secondary education in a comprehensive high school and then participate in on-the-job training after high school graduation. There are also some public vocational programs; however, they have a lower status than the general or academic tracks, making them unattractive for company involvement. This leaves higher-level vocational training to community colleges or trade schools where students have to pay for their training and there are limited connections to industry (Busemeyer & Trampusch, 2012, p. 13.)

TABLE 1.1: CATEGORIES OF SKILL FORMATION SYSTEMS

Public Commitment to vocational training	Involvement of Firms in Initial Vocational Training		
		Low	High
	Low	Liberal Skill Formation Systems (U.S.)	Segmentalist Skill Formation (Japan)
	High	Statist Skill Formation (France)	Collective Skill Formation Systems (Germany)

Source: Busemeyer and Trampusch (2012). Table 1.1, page 12.

Although 67 percent of U.S. comprehensive high schools offer some vocational classes, most students only take one or two. Vocational high schools where students are more likely to finish with a recognized credential, educate less than five percent of high school students. Similarly, regional vocational centers, where students go solely for vocational courses while still attending comprehensive high schools, are attended by six percent of high school students (Silverberg, Warner, Fong, & Goodwin, June, 2004, p. 21). These vocational schools are usually public institutions with minimal industry involvement.

Contrast that with Germany where the business community has a long history of involvement in vocational education at the secondary level. Germany's coordinated vocational training system is considered "collectively organized" because of the involvement of firms, intermediary associations, and the state in vocational training. In this system, firms are heavily involved in the financing and actual administration of the training. Intermediary organizations such as unions or employer associations are also involved in the administration and ongoing reforms of the training. Trainees receive portable, certified occupational skills, and the training itself takes place in both schools and companies. (Busemeyer & Trampusch, 2011, pp. 4-6).

Germany is well known for its dual vocational training where students simultaneously complete an apprenticeship and go to a vocational school. In 2012 about 51 percent of German students participated in vocational education, most of them in the dual vocational system of learning (Hensen & Hippach-Schneider, November, 2012, p. 16). In 2013 there were about 340 nationally regulated training paths (BMBF, n.d.). For

students in vocational education programs in Germany, 43 percent of their educational expenses are funded by non-public sources including businesses involved in vocational training (Autorengruppe Bildungsberichterstattung, 2012).

There is substantial comparative research about the development of vocational education in the U.S. and Germany (Buechtemann, Schupp, & Soloff, 1993; Busemeyer & Trampusch, 2012; Hoffman, 2011; Powell & Solga, 2008; Shackleton, 1995; Thelen, 2004). Included in any of this literature is the role of employers in vocational education, or the lack thereof in the case of the U.S. but what is missing in the research is the broader picture of industry involvement in education. For example, does engagement in vocational education at the secondary level influence philanthropic involvement in K-12 education? When reading about corporate philanthropic engagement in education, we are usually only seeing one side of a picture of corporate involvement in education. A comparison of the role of corporate involvement overtime and how this is impacted by changes in the vocational and general education spheres can help predict future trends in corporate philanthropic involvement.

Need for Research About Corporate Philanthropy in Education

Research about the role of philanthropy in education in the U.S. is a topic of growing interest; however it remains somewhat limited due to fears among researchers and school districts of being cut off from funding by major donors (Hess, 2005b, pp. 10-11). Thankfully in the last decade, there have been more researchers (Bacchetti & Ehrlich, 2007; Greene, 2005; Hess, 2005b, 2010; Quinn et al., 2013; Ravitch, 2010, Chapter 10; Reckhow, 2013a; Tompkins-Stange, 2016) who have brought academic rigor to the discussion around the role of philanthropy in education. In Germany, the dearth of research on the topic is even more pronounced (Thümmler, Bögelein, & Beller, 2014a, pp. 9-10) but it also appears to be a growing topic of interest (see for example: Hartong, 2012; Höhne, 2012; Höhne & Schreck, 2009; Kolleck, 2015; Kolleck, Bormann, & Höhne, 2015; Striebing, 2017). Some researchers have even done some comparison work on the role of philanthropy in education in the U.S. and Germany (Thümmler et al., 2014a). Most of the research however focuses on the largest and often

most controversial education donors such as the Bill and Melinda Gates Foundation in the U.S. or the Bertelsmann Foundation in Germany.⁵

Corporate philanthropy in the U.S. and Germany has grown significantly over the last two decades with education as a clear priority. Aside from case studies however, (see for example: Gerber, 2006; Hartong, 2012; Höhne & Schreck, 2009; Porter & Kramer, 2002) research on corporate philanthropic involvement in education remains scarce. There is some research on the corporate philanthropic involvement of companies that may also directly benefit from their giving such as schoolbook publishers and private school operators (Ball, 2012). There are others who have focused on global coalitions of large companies that focus on education in developing countries to increase education access and quality (Bhanji, 2016; Van Fleet, 2011, 2012). The overall education interests and activities of large companies within their home country however have not been researched. Part of this may stem from the limited amount of research overall on corporate philanthropy (Gautier & Pache, 2013, p. 2).

Some may argue that they do not focus on corporate philanthropy for a good reason: corporate foundations are rarely among the top donors to education and therefore do not matter as much. Going by funding alone, this is not wrong. When one looks in the U.S. at the top 50 funders to K-12 education, just two corporate foundations are listed and they are closer to the bottom of the list with the Lowe's Charitable and Education Foundation at number 34 and the J. P. Morgan Chase Foundation at number 41 (Foundation Center, 2013b). Going just by the funding amounts of foundations however misses some major elements of corporate philanthropy.

First, foundations are just one way that companies give philanthropically. What is the definition of corporate philanthropy and what is a corporate foundation? A corporate foundation is defined as "a private foundation that derives its grant-making funds primarily from the contributions of a profit-making business and/or its employees"

⁵ Bertelsmann Foundation is the majority shareholder of Bertelsmann SE & Co. KGaA, a practice that is not allowed in the U.S. Although it is a form of a corporate foundation, it is hard to compare it to the CSR-style foundations (see explanation further below) that are the focus of this research.

(Alberg-Seberich, 2010, p. 681). By law in the U.S., these foundations have to be separate entities from the business itself (Toepler, 2006, pp. 325-327).

In Germany there are many different types of corporate foundations. There are foundations that own the company, foundations that are the company, and corporate foundations that received a starting fund or receive ongoing funds from the company itself⁶ (Hirsch, Neujeffski, & Plehwe, 2016, pp. 10, 25; Junck, 2007, p. 14). For comparative purposes, this research is focused on the latter and is often referred to in German literature as a CSR-style or Corporate Social Responsibility style foundations.

Corporate philanthropy however is a much broader topic and includes both corporate foundations and direct corporate giving. It can be defined as “when businesses voluntarily contribute money or donate in-kind contributions to nonprofit organizations or for a charitable purpose without receiving any services in return.” This study involves corporate foundation funding of education but also direct giving. While the foundations have to abide by laws related to nonprofit giving, reporting requirements and specific tax code sections, direct corporate giving programs are not separate legal entities and can include direct monetary giving, employee matching programs, and in-kind gifts such as goods or services (Foundation Center, 2016).

To make this point even clearer, see the Taxonomy of Global Corporate Social Engagement from Bhanji (2016). Although my research is not focused on global but on giving within the home country, the point here is to delineate the different types of corporate or corporate-related philanthropy and to point out that my research is focused on the bottom two categories, CSR and Shared Value. This is different from individuals who are associated with a company but choose to give some of their own income or assets. This is individual giving with examples including Rockefeller or Krupp (Nährlich, 2010, p. 571) or Bill and Melinda Gates. For this reason, the private foundations of individuals are not included in this analysis.

⁶ Hirsch et al. and Junck also include foundations created by the owners of the company or their families as part of their analysis but as explained above, I do not. Hirsch et al. also argue for the inclusion of two additional types of corporate foundations—those that are a partnership between employers and industry associations and those that are partnerships between employers and public entities. See page 25

TABLE 1.2: TAXONOMY OF CORPORATE SOCIAL ENGAGEMENT

Type of Corporate Social Engagement	Interests	Governance Structure
Private foundation philanthropy	Philanthropic	Separate foundation external to business entity
Corporate social responsibility (CSR)	Business and Philanthropic	Foundation or corporate giving department within company
Shared value/business sustainability	Primarily Business and Philanthropic	Within company marketing or other business department

Source: Bhanji (2016), p.423, updated from Bhanji, 2008

Secondly, unlike other types of philanthropic giving, corporate philanthropy serves as a representative of the corporation itself. This is especially true with corporate foundations. Unlike other private foundations, corporate foundations have companies with far more value and political power behind them. With large corporations, this brings additional benefits that cannot be easily monetized but could give them significantly more influence. For example, the board members of the foundation, which often hold high offices in the company, can benefit the foundation by bringing more recognition and legitimacy. The foundation can also build off of their networks (Hirsch et al., 2016, p. 16; Höhne, 2012, p. 243). Corporate foundations also have a tricky balancing act to play between their shareholders who want to see impact and their role in promoting the public good. They are able to bring financial means, cultural capital such as expertise, their ties to industry, and a nonprofit status associated with the public good that makes them seem neutral (Höhne & Schreck, 2009, pp. 122-123). In other words, it is important to study corporate philanthropy separately because they bring additional elements to the table that may make them more impactful.

Third when it comes to philanthropic money in education, one could argue that the amounts given in comparison to public budgets for education are minimal and therefore the influence of philanthropy on education is minimal. This is even more so

for corporate philanthropy. In the U.S. it is estimated that foundations give about \$2 billion annually to K-12 education. That may sound like a lot of money but with a system that spends about \$600 billion per year, this comes to 0.33 percent or “a rounding error” (Greene, 2015, pp. 11). Similarly in Germany, using a different analysis and 2006 figures,⁷ it was estimated that public spending was about €102 billion annually. With about €78 million coming from philanthropy, that is about 0.33 percent of one day of the education budget (Thümmler et al., 2014a, pp. 6-7). By any measures these are absolutely marginal figures; however a simple calculation of numbers ignores the fact that the vast majority of the public spending for K-12 education goes to fixed costs such as teacher and administrator salaries, pension plans, and building maintenance and renovation. Very little is available for developing innovations or pushing for change. Instead, school districts need to focus on the day-to-day work at hand, meaning that foundation money towards creating new programs or advocating for change may have a very disproportionate impact on schools (Hess, 2005b, p.1; Hoffman & Schwartz, 2007, p. 112). As with general philanthropy, corporate philanthropic giving is not just about the dollars but the influence of them.

Last but not at all least, corporate influence in education is unique because companies are often considered the end consumer of what the education system produces. With this in mind, companies are able to bring extra legitimacy to the debate about how education should be improved. This may be looked at with rose-colored glasses or with serious cynicism. On the one hand, if companies are advocating for changes to the education system that align with their needs but also provide students with knowledge and skills that are valuable on the job market and in life, it can be seen as a win-win. But what if company involvement in education results in over-training in certain fields, leading to an oversupply of workers with these skills and downward wage pressure? This could happen either on purpose if a corporation actively promoted particular fields with the goal of keeping wages in check. This could also happen inadvertently through changes in the job market, as it is quite difficult to predict what will be valued in the future (Charette, 2013). For this reason, it is important to monitor what companies are funding and why.

⁷ In the same analysis, philanthropy in the U.S. was estimated to have contributed to 2.3 full days; however this also included philanthropic funding for higher education and other programs that are not a part of K-12 education.

Bringing it all together: corporate philanthropic spending on and attempts to influence education matters because the amount of public funds spent on K-12 education is massive. If companies and their foundations are actively trying to steer the way taxpayer money in education is spent, we should know why and how. Although foundations are spending a fraction of what the state does on K-12, and corporations and their foundations arguably far less than that, what matters is what they are spending their money on and how they are influencing the education system. This is all the more relevant for corporate philanthropy, which often acts as the civil society representative of the company itself, giving it an even louder voice.

Also corporate philanthropic involvement in education is likely here to stay. An understanding of its overall role in K-12 education and its influence is it important for future research on education actors. In fact, corporate philanthropy may grow over the next years, assuming the economy continues to improve in the U.S. The same is likely in Germany where the economy has been growing and with it, philanthropic funding. This will also be a factor with the many technology companies in the U.S. As a recent New York Time series dedicated to the disruptive role of the tech giants noted “In the space of just a few years, technology giants have begun remaking the very nature of schooling on a vast scale, using some of the same techniques that have made their companies linchpins of the American economy. Through their philanthropy, they are influencing the subjects that schools teach, the classroom tools that teachers choose and fundamental approaches to learning” (Singer, 2017).

Within education research, there is a significant amount of research about the privatization of K-12 education. Many of these researchers are focused on the privatization of the actual provision of education with private school attendance, charter schools, and vouchers for private schools as popular topics of their research. There is often an emphasis on the role of the state versus the role of the private sector (see for example: Henig, 2008; Koinzer, Nikolai, & Waldow, 2017; Levin, 1991). A related string of research is about the roles and interests of the state and other actors in the creation of education policies, their implementation, and their effects or more simply put, educational governance (see for example: Fusarelli & Johnson, 2004; Herbert Altrichter, 2007; Mehta, 2013; Meyer & Benavot, 2013). My research runs

through both of these areas because it is concerned with the role of corporate philanthropic actors, which are private actors who are associated with powerful companies, and are actively engaging in the governance of public education. In these cases, they are bringing together groups of actors behind the ultimate message of improving STEM and MINT education. It aligns itself well with other education researchers who have been active in analyzing how foundations have become active in education (see above).

Outline of the Book

In chapter 2, the theoretical basis of my research is laid out. To analyze the role companies have played in education I draw on historical institutionalism. The historical institutional lens is ideal for comparing how corporate philanthropy came to the idea of funding education initiatives aimed at improving STEM and MINT education in Germany and the U.S. This is especially relevant given that their education systems have allowed for different levels of engagement with companies over time. In focusing more specifically on the path dependency line of theory (Ebbinghaus, 2009; Mahoney, 2000), I was also able to go deeper into some moments of time by focusing on potential critical juncture points such as the passing of No Child Left Behind in the U.S. or the PISA Shock in Germany.

Path dependent theories were helpful in identifying what stayed the same. However, to understand more about what may have caused industry involvement in education to change, ideational theory was used (see for example: Béland, 2007; Hay, 2011; Schmidt, 2011). The concept of a policy paradigm (see for example: Daigneault, 2015; Mehta, 2013, pp. 18-23) or a sub-policy paradigm was used as a way to evaluate the how actors within the education policy community came to have the same problem definitions of needing to improve STEM and MINT education and how they brought people together. But because the focus is ultimately on the role corporate philanthropy played in STEM and MINT education, the theory of institutional entrepreneurs is also applied. Here the idea is to further define if companies and their foundations have been playing a leading role in the MINT and STEM movements. The three components of institutional entrepreneurship are addressed: mobilizing resources, developing discursive strategies, and bringing

together new groupings of stakeholders (DiMaggio, 1988, pp. 14-16; Leca, Battilana, & Boxenbaum, 2008; Thümler, 2014).

Chapter 3 contains the methodology; which consists of four major components. In the first part, top companies and, their philanthropic interests in education are identified. In the second part, expert interviews (Bogner, Littig, & Menz, 2014; Gläser & Laudel, 2010; Meuser & Nagel, 2010) were conducted with corporate philanthropic leaders and nonprofit organizations involved in STEM and MINT education. The third part of the methodology describes how the information from the interviews were analyzed using Qualitative Content Analysis (Mayring, 2010; Schreier, 2012). Last, the process for analyzing relevant documents and secondary literature (Cohen, Manion, & Morrison, 2007, pp. 201-204; Patton, 2002, pp. 253, 555-556, 559-560) to check the answers of the experts and to provide additional context is described.

Chapter 4 is the historical chapter, which compares the ways corporations have historically been involved in K-12 education in Germany and the U.S. Included here are important sequences of events and data that detail the way companies have been active in education through vocational education and corporate philanthropy and what may have influenced them. It is split into three time frames, the late 1940s-1950s, the 1960s-1970s, and the 1980's-1990s. The main questions addressed in this chapter are: (1) Why and how did corporate involvement in K-12 education change overtime in Germany and the U.S.? (2) What were the driving factors and actors behind these changes (3) How did these changes effect the options for corporate philanthropy in K-12 education by the end of the 1990s?

Chapter 5 is basically a continuation of chapter 4 but it focuses on the 2000s. It is separated out because it is focused on providing context regarding the involvement of companies in K-12 education in both countries for the expert interviews. The content included is critical to understanding the conditions surrounding the decisions of companies and their foundations engaged in education. It also includes unanswered questions, which I address in the interviews.

In chapters 6 and 7, the German and American findings are presented. In both chapters, the responses of the experts but also documents and secondary literature are

analyzed to determine how corporate philanthropy became active in K-12 education. The early 2000s are evaluated in great detail for the potential of a critical juncture. This is followed by the analysis of STEM and MINT education as sub-policy paradigms and is completed with the study of corporate philanthropic actors as institutional entrepreneurs. In the American chapter there are several comparisons.

The 8th and final chapter opens with a comparison of how the historical development of company involvement in education shaped the opportunities available for corporate philanthropy. It is followed by an analysis of the ideas and influencers that impacted the effectiveness of the sub-policy paradigms of STEM and MINT education. Corporate philanthropic actors as institutional entrepreneurs and the effects of branching out into new territory within the education field are also evaluated. The chapter is rounded out with a conclusion section and suggestions for additional research on corporate philanthropy in education.

Chapter 2: Theory

Overview

Leaning on historical institutional theory, the path dependent nature of the involvement of major companies and their philanthropic arms in K-12 education in Germany and the U.S. is explored before coming to potential critical juncture points in the early 2000s. I assume that a new policy paradigm of educational failure developed and more specifically, a “sub-policy” paradigm that science, math, and technological education were in dire need of improvement in both countries. To bring this point forward, corporate philanthropists, acting as institutional entrepreneurs, started to gradually shift away from independently supporting school and district projects. Instead they came together to support policy change aimed at the MINT and STEM education fields they perceived to have the greatest impact on their long-term prospects. To do so, companies and their foundations brought together resources, various groups of stakeholders, and created a new discourse around the need to improve STEM/MINT education. They acted in ways that seem similar but are quite unique to the contexts in each country.

Historical Institutionalism and Path Departure in Corporate Philanthropy’s Support of Education

There are three main types of institutionalisms in the social sciences: historical, rational choice, and sociological. Institutionalists all see rules as institutions that affect behavior but they have differing beliefs about what actually drives actors to behave the way they do. For all of them, institutional structures play a large role in shaping the decisions and actions actors take (Hall & Taylor, 1996, p. 936; Steinmo, 2008, pp. 125-127). Given that my research is about the role corporations and their foundations in education in two countries and why they fund some of the education initiatives they do, institutionalist theories seemed the right place to start. Below I will briefly describe each one and why historical institutionalism is most relevant for my research.

In comparative politics, institutionalism used to refer to studies that compared the legal, administrative, and political structures of institutions with little to no explanation as to why the structures existed as they did and how the people affected their course. In the 1950s and 1960s, researchers wanting to have more political behavioral meaning to institutions and policy change focused heavily on the distributions of power, attitudes, and political actions across countries. But this was largely to the detriment of the institutions in which all of these factors took place. These studies also often concluded that a great homogenization among nations was taking place. Starting in the 1970s and 1980s, historical and rational choice institutionalism developed. The goal was to answer questions about the diverging policy outcomes happening as a result of the political turmoil and economic shocks of several advanced economies. The “new” institutionalists sought to find the differences between countries through a combination of the behavioralist and institutional approaches. “Key to their analyses was the notion that institutional factors can shape both the objectives of political actors and the distribution of power among them in a given polity” (Thelen & Steinmo, 1992, pp. 3-7, see also Hall & Taylor 1996).

Rational choice institutionalists focus on actors pursuing their interests using structures of incentives according to logic of calculation (Hall & Taylor, 1996, pp. 944-945; Schmidt, 2010, p. 47). In this sense, the institutions limit the strategies the actors pursue but the actors act in a way that maximizes their self-interest (Thelen & Steinmo, 1992, p. 7). Rational choice institutionalists propose that an actor’s behavior is driven by a strategic calculus that includes expectations about how other actors are likely to act but are not affected by historical factors (Hall & Taylor, 1996, p. 945).

Critics of rational choice argue that although institutions limit the range of options available, actors cannot know everything and often act according to societal norms (Thelen & Steinmo, 1992, p. 8). Furthermore, rational choice assumes that actors know all of their possible choices, the potential outcomes of the choices, and the chances of success for each of the choices. In reality actors are less than sure about how to achieve their interests or what exactly their interests are given the fact that there are many uncertainties (Schmidt, 2010, p. 58; Thelen & Steinmo, 1992, p. 7). In

analyzing the history of philanthropic activities in Germany and the U.S., Frank Adloff (2010) argues that simply focusing on the self-interest of philanthropists ignores many of the organizational and institutional factors that drive philanthropic actors (pp. 25-33). In agreeing with these critics of rational choice institutionalism and with Adloff's view on philanthropy, I chose to go deeper in finding out more about why corporate philanthropy invests in education the way they do in Germany and the U.S. What are the institutional and societal factors that drive their funding decisions in education and how did these factors develop. One can always argue that companies are only interested in increasing profits and that everything they do is aimed at this goal. That however, ignores the many other influencing factors around them that drive them to make specific choices in funding education or even their perceptions of what is in their best interests.

Historical institutionalists do not dispute that actors act in ways to maximize their self-interests. They go further however to uncover the roles of institutions in shaping strategies and goals. They believe that although actors act in their self-interests, they could not possibly analyze exactly what those interests are at each step of the way. "In short people don't stop at every choice they make in their lives and think to themselves 'Now what will maximize my self-interest?' Instead most of us, most of the time, follow societally defined rules, even when doing so may not be directly in our self-interest" (Thelen & Steinmo, 1992, p. 8). From another historical institutionalist vantage point, "actors are strategic, seeking to realize complex, contingent, and often changing goals. They do so in a context which favors certain strategies over others and must rely upon perceptions of that context which are at best incomplete and which may very often reveal themselves inaccurate after the event" (Hay & Wincott, 1998, p. 954). In broadening the theories about why a particular preference was formed, historical institutionalism allows for the study of the development of political institutions and their constituent parts (Schmidt, 2010, p. 47).

Historical institutionalism is used to show how political changes are affected by the institutional settings they are located in (Ikenberry, 1988, pp. 222-223). Studies in historical institutionalism define institutions to include "both formal and informal rules and procedures that structure conduct" but in general are most interested in the state and societal institutions that shape how actors define their interests and interact

with other actors (Hall & Taylor, 1996, p. 938; Thelen & Steinmo, 1992, p. 2). In a historical institutional view, institutions both shape the goals of actors and the way they approach these goals (Hall, 1986, p. 19). Corporate philanthropy does not develop in a vacuum, it is created by the corporations themselves. Part of the way corporate philanthropy defines its interests in education is based on the role corporations have played in education in the past.

As a result of the characteristics of historical institutionalism mentioned above, many scholars have used it for comparing how and why changes in educational policy have occurred. These scholars have all focused on the many factors that lead to specific changes in education policy. The emphasis was on the impact of historical context on institutional factors, as well as, the way various actors behaved as a result of them (Busemeyer, 2009; Edelstein, 2016; Edelstein & Nikolai, 2013; Meyer, 2011; Thelen, 2004). Similarly in my research, of how and why companies and their foundations fund education, an understanding of the ways they have interacted in education in the past and how that impacts their decisions today is especially relevant.

Historical institutionalism also allows for the development of theories about why particular preferences were formed. Unlike rational choice, the assumption is not just that the actor acts in self-interest but that there are many other factors involved. In this sense, alliance formation is not just a group of self-interested actors but a group that may have conflicting interests but with many factors that influence their decisions to work together (Thelen & Steinmo, 1992, p. 9).

One of the hallmark characteristics of historical institutionalism is the recognition that political development happens over time and that historical points of time influence reality (Pierson, 2000, pp. 264-265). Here the focus is on path dependency or the idea that given the same treatment, institutions will have different results because of the contextual features of the institution that were inherited from the past. As a result historical institutionalists tend to concentrate on explaining how institutions came to develop such paths (Hall & Taylor, 1996, p. 941, see more on this below). To this end, historical institutionalism has often been used in comparing public policy with an emphasis on the impact of national political institutions on relations between other actors such as legislators, organized interests, the electorate, and the judiciary (Hall &

Taylor, 1996, p. 938). The historical institutional lens is ideal for comparing how corporate philanthropy came to the same idea of funding STEM and MINT education in Germany and the U.S. This is especially relevant because their education systems have allowed for different levels of company engagement in education over time. It allows me to assess how corporate philanthropic attitudes towards education have changed and what has affected their involvement.

As my historical chapter shows, in Germany, there is a long history of companies being involved in education at the secondary level through dual vocational training programs. This continues to be the main avenue of involvement of companies in the education sphere. However, since the 1990s there has been a large decrease in both company and student participation in dual vocational training programs and an increase in corporate philanthropic involvement in education. In the U.S., companies did not play much of a role in K-12 education until the 1980s when a major report about America's low standing in education compared to other countries sparked national outrage. Simultaneously, a newly enacted tax advantage for companies left them seeking ways to look good to the public. Since then companies have been involved in education but mainly for general education, they have had very little involvement in vocational education at the secondary level. Around 2000, however, there seemed to be some big questions about the effectiveness of their investments in education as new foundations from technology companies started to advocate for more outcomes-based philanthropy. Taking into account how companies have been involved in education in the past in both countries is paramount in understanding why they have invested in STEM and MINT education initiatives recently and the contextual factors facing them as they address these issues but one should also account for the current social norms and expectations that drive actors to act and this is where sociological institutionalism comes in.

Sociological institutionalism is also a "new institutionalism" but unlike rational choice and historical institutionalisms; which were rooted in political science, it comes out of sociology. It is rooted in the view that humans are social and sensitive to social norms. In other words, humans do not always ask themselves "how can I maximize my interests." Instead, they ask themselves "what should I do?" What is appropriate in this situation or given the circumstances (Steinmo, 2008, p. 126). This

is also relevant in corporate philanthropic giving in education where people working as representatives for corporations or their foundations interact with many actors on their behalf. In this role, they must be sensitive to the social norms that surround their work and the expectations that people have of the corporation and its foundation.

Also starting in the 1970s, sociological institutionalists viewed the many forms and procedures employed by modern organizations as less about being as efficient as possible and more about adhering to social norms and expectations. They argued that these practices and decisions “should be seen as culturally-specific practices, akin to the myths and ceremonies devised by many societies, and assimilated into organizations, not necessarily to enhance their formal means-ends efficiency, but as a result of the kind of processes associated with the transmission of cultural practices more generally.” As a result sociological institutionalism attempts to explain why organizations take on particular forms and procedures and how they spread across fields or nations (Hall & Taylor, 1996, pp. 946-947, quote p. 947). My research is an attempt to explain how and why corporate philanthropy came to fund STEM and MINT education in the two countries and the mechanisms they are using as organizations to drive their work forward. There are expectations of corporations in society, the question is if STEM and MINT education initiatives help them fill these expectations and helps them maintain their legitimacy.

In this light, John W. Meyer and Brian Rowan (Meyer & Rowan) theorized that organizations use current rationalized practices and procedures not because they are most efficient but because it increases their legitimacy and thereby ability to survive. Institutional environments lead to organizations incorporating practices and procedures that are legitimated outside and use ceremonial measuring methods to show that they are working while creating institutional stability. They specifically used U.S. school district organizational practices to show how ever-changing external expectations led to marginal reforms while the major practices of what people expect to see in schools remained the same; such as teacher certification and graduation requirements. Both the old and minimal new structures of schooling conform to societal expectations of what schools should do, with outcomes receiving little if any attention (Meyer & Rowan, 1977, 1978). In other words, while the assumption was that schools are there to provide the best instruction and therefore, the best outcomes

possible, there were few steps taken to ensure that really was the case, rather the institutional structure of schools is stable because it is legitimate in the eyes of the public.

Anyone reading any of the headlines regarding education today would quickly recognize that the lack of attention to outcomes has since changed. With the accountability movement that seems to have taken root worldwide, outcomes are increasingly of interest. However research on public-private partnerships in education in the U.S., Germany and Switzerland has shown that foundations often do not evaluate their work in a rigorous way to see if their projects have a lasting impact in education. Even when they do, minimal positive results or the lack of results does not necessarily result in the revamping of a project. Instead, they rely on the societal expectation of the entrepreneurial and “new management” behaviors of foundations for their legitimacy in these endeavors (Thümler, 2013; Thümler, Bögelein, & Beller, 2014b). Unlike general philanthropy, corporate philanthropy also has the added expectations of society that it is seen as representing the company it derives its money from. I expect that part of the reason that corporations or their foundations fund STEM and MINT education is that they think society expects them to do so. Part of this is because they are expected to “give back” to society, but some of this is also due to the legitimacy they have in economic issues. In supporting these education issues, I assume that corporate philanthropy assumes this is what society expects of them to do.

The entrepreneurial behaviors of organized philanthropy, if not taken on because of their proven effectiveness, may also be isomorphic in nature. DiMaggio and Powell’s seminal 1983 article defines three types of isomorphism among organizations once they are considered to be in the same field: “1) *coercive* isomorphism that stems from political influence and the problem of legitimacy; 2) *mimetic* isomorphism resulting from standard responses in similar ways; 3) *normative* isomorphism, associated with professionalism” (DiMaggio & Powell, 1983, p. 150). Mimetic and normative isomorphism are most applicable to my research. Mimetic isomorphism because organizations tend to model themselves on organizations they see as successful or legitimate. In this case, I assume that corporate philanthropy seeks to organize themselves in ways that are considered to be strategic and in doing so, end up funding

similar initiatives. Normative isomorphism because I assume that corporate philanthropy is becoming more professionalized and that as that happens, specific practices and preferences are becoming common across corporations but also internationally.

A study found that corporate philanthropy officers relied more on the opinions of philanthropy officers from corporations that they saw as equal to themselves rather than from people within the corporate philanthropic network as a whole (Galaskiewicz & Burt, 1991, p. 104). Jerome L. Himmelstein's study of 55 corporate philanthropy officers from major U.S. companies found that there were two major inter-twined rationales for giving. In "classwide rationality," they were influenced by the long-term needs of business and society as a whole. In "company rationality," the immediate needs of their individual companies were the leading rationale. This led to "strategic giving" and a type of professionalism in the form of business-like giving among corporate philanthropy officers (Himmelstein, 1997, see especially chapters 1 and 3). These studies seem most reflective of the mimetic and normative isomorphism DiMaggio and Powell described. I assume "classwide rationality" plays a role in corporate philanthropic involvement in STEM and MINT. I assume companies or their foundations justify their investment in these areas as benefiting society through long-term economic benefits of having more science and technology skills. While some companies may be working towards initiatives that have a more direct benefit on the company, investing in STEM and MINT K-12 education initiatives likely do not have many direct benefits to the company.

As I stated in the beginning however, I have grounded my research in historical institutionalism. The historical institutionalist perspective allows for a richer analysis of institutional, political, and cultural factors as it allows for the identification of key events and changes overtime. As some institutional scholars have determined, historical institutionalism allows for the flexibility to draw from and actually has the potential to benefit from the other institutionalisms (Hall & Taylor, 1996; Thelen, 1999; for opposite view, see: Hay & Wincott, 1998). Historical institutionalism accounts for both rational choice and sociological institutionalisms but takes historical elements into account. It assumes that humans will act in their own interest but that they will also account for context and social norms (see also: Hall, 2010; Steinmo,

2008, p. 126). A comparison of corporate philanthropic engagement in STEM and MINT education in the two countries lends itself well to rational choice concepts of self-interest or perceived interest and sociological institutionalist concepts of legitimacy and isomorphism. Historical institutionalism however, will also account for the very different paths corporations have taken in their approaches to supporting education in the U.S. and Germany. I assume that corporate philanthropic actors have an interest in investing in STEM and MINT education, namely to have more skilled workers in the long run. I also assume that the decisions they make are tied to their roles in education in the past and to the current expectations and norms for their involvement.

Path Dependent Theories in Education and Philanthropy

One strand of historical institutionalism includes path dependent theories; which, have often become synonymous with showing how the “past matters” in shaping the future. Encompassed within in these theories are actually two different main categories of path dependence (Ebbinghaus, 2009, p. 191; Mahoney, 2000, pp. 507-509). Self-reinforcing sequences refer to the roles of the formation and reproduction of an institutional pattern. Reactive sequences are chains of events that are dependent on events that preceded them. “Whereas self-reinforcing sequences are characterized by processes of reproduction that *reinforce* early events, reactive sequences are marked by backlash processes that *transform* and perhaps *reverse* early events. In a reactive sequence, early events trigger subsequent development not by reproducing a given pattern, but by setting in motion a chain of tightly linked reactions and counter-reactions” (Mahoney, 2000, pp. 507-509, quote p. 527).

Of interest for this research are the reactive sequences with a focus on identifying the “key choice points” or as some say, “critical junctures.” These points in time force actors to choose one pathway over other possible paths in (Mahoney, 2000, pp. 526-527). Critical junctures in national policy-making often lead to changes that can impact generations of people. Once these decisions are made, it is often difficult to reverse them. There are long-term consequences, which further limit the range of future options and ultimately distinguish the two nations (Ebbinghaus, 2009). In essence, it is hard to make particular types of changes once a particular path has been chosen.

In his analysis of the paths taken in education by Germany and the United States post 1945, Heinz-Dieter Meyer (2011) shows that despite each country's education system being influenced to some degree by the other and a critical juncture of the two systems after the end of WWII, the two systems remain structurally intact and distinct. His analysis of the continued structure of the secondary schools shows how central tenets of the founding of the education systems impeded future changes. This held even when these changes were being forced on Germany under American military control! In the U.S., the education system was founded on the belief that schools were to espouse common values towards building citizens of the new country and education could work towards equality; essentially the "one best system" of education. In Germany, the idea of *Bildung* was focused on self-perfection and cultural class distinctions. The path dependence of the two education systems has impeded their abilities to make large-scale changes, leaving disadvantaged students in both countries in "inner-city and *Hauptschul*-educational ghettos" (Meyer, 2011, p. 190).

In another analysis of the path dependence of German schools in Hamburg and Saxony, Rita Nikolai and Benjamin Edelstein (2013) show how the structure of the secondary schools changed to two-level systems between the after-war period and 2010. In Sachsen, even though there were major changes, including the reunification of Germany, the secondary school structure basically remained as it was but with minor changes and new names. In Hamburg, the tripartite system went through many reforms and political contestations over the years. An example is the addition of the very popular integrated school (*Integrierten Gesamtschule*); which aided in the decline of the *Hauptschule* (lower secondary school), ultimately leading to the adoption of a two-tiered model of schooling. The two-tiered systems the two states adopted were different because of earlier policy decisions (Edelstein & Nikolai, 2013).

Kathleen Thelen's seminal work on the political economy of skills development is another good example of path dependence theory in a comparative perspective that is highly relevant to this work. Thelen shows that differences observed in the skill formation systems of countries today can be traced back to the settlements made by employers, artisans, and the early trade unions in the 1800s. She argues that the arrangements made then set each country on its own trajectory of skill formation.

Thelen's analysis of the certification and monitoring of skill development demonstrates how these early policy decisions affected the level of attractiveness of vocational trades to the youth population. In Germany, early decisions regarding certification and monitoring by the state allowed apprentices to earn a certificate that was valuable in the labor market. It provided a path to employment in promising firms with the potential for advancement. In the U.S., by contrast, firms initially took on training of workers themselves but this eventually went to the wayside as they rationalized production and shifted their training offerings to supervisory staff, which often had college degrees. This lack of certification and limited ability to advance in companies made vocational education in the U.S. much less attractive; which holds today (Thelen, 2004 ,see Chapters 1,2,4,6). I argue that company involvement or the lack of it in vocational education likely effects the ways companies can be involved in education through philanthropic endeavors. U.S. firms are likely engaging more in corporate philanthropy in education and even using it to address vocational education needs; where as German firms do not have such a strong tradition of corporate philanthropy and are likely not using it to address vocational education needs.

In a similar line of theory, Helmut K. Anheier and Lester M. Salamon developed the Social Origins Theory to explain how the historical development of the state, and other social forces, such as the church or the elite, impact the type of nonprofit sector a country has. In this theory, Germany has a corporatist nonprofit sector characterized by high government spending on social welfare and a large nonprofit sector that acts almost as an arm of the government. This is due to the governments attempt to satisfy an historically landed elite while answering to the demand for social welfare services and the roles of the churches as service providers. The U.S. has a liberal nonprofit sector characterized by low government social welfare spending and a large nonprofit sector. A minimal elite and an urbanized middle class that was hostile to large-scale government social benefits drove this. In its stead were preferred voluntary activities, often funded by private foundations (Salamon & Anheier, 1998).

Applying this theory to the foundation sectors across Europe and in the U.S., Helmut K. Anheier and Siobhan Daley describe different foundation sector models. Of most importance here are the corporatist, state-controlled, and liberal models. The corporatist model builds on the corporatist model of nonprofits above where operating

foundations act as subsidiaries of the state in providing social welfare services. While Germany is described as having more of a corporatist foundation sector, the authors also noted growth in new foundations in Germany that have more of a liberal model. In the liberal model, foundations often see themselves as a parallel system to government and providing alternative options to the mainstream. While the United States is known for having a liberal model, it is also considered to have a strong role for the state in terms of laws and monitoring. A state-controlled foundation sector is tightly controlled by the government with restrictive laws and extensive administration and oversight (Anheier & Daly, 2006b, pp. 17-20, 50-52). I assume that in both the United States and Germany, that corporate philanthropy is operating in more of a liberal model in supporting education initiatives and see their support of STEM as a way of pushing the government to act rather than simply going along with what the state chooses to do in education. In the U.S. I assume this because this has always been the case but with some state-control elements. In Germany, I also assume that corporate philanthropy will be in more of the liberal model because much of what is considered corporate philanthropy was started recently and because I assume companies will want to act more autonomously in their support of education causes.

The path dependency theories mentioned above in education policy have shown how previous policy decisions and factors have affected the future options for actors in making education policy decisions. Comparisons in this realm have provided insightful analyses as to why education policies took the shape they did in different locations. All of these analyses have showed the “stickiness” of institutions or the ability for certain elements to have long-lasting effects on the choices available to actors but that change still happens. They have also all included a relatively long period of time in their analysis and many temporal conditions and factors that led to changes along the way that explain the differences exhibited.

In comparing the role of corporate involvement in education in the U.S. and Germany, and more specifically, the role of corporate philanthropy, I assume that the role of companies in the past influences the decisions they can make today. As I outlined in the historical chapter, Germany has a long history of companies investing in education through dual vocational training. Although this is still the case, there have

been many factors that have led to changes and decreases in their involvement in dual vocational training. At the same time, Germany does not have a long history of corporate philanthropic involvement in education but this is growing as part of a boom in foundations and a growing interest in showing corporate social responsibility (CSR). I assume most companies still invest in dual vocational training- that this is “sticky.” Further, this investment and involvement makes them far less likely to invest in vocational education from a philanthropic perspective but that the weaknesses in the dual vocational system inform their desire to invest in education more generally. In the United States where there has never been much investment of companies in secondary level vocational education, I expect this to still be the case for the most part but that there is a growing interest in vocational education because of the specific needs of companies. They are not limited by any current involvement in their regular operations. I assume that American companies will continue their long tradition of investing in education initiatives from a philanthropic perspective but that their past investments experiences in education will effect the types of education investments they make today.

Recognizing that there are times and events that result in significant institutional change, I turn now to the critical junctures; which, receive minimal attention in historical institutionalism. They are often seen simply as turning points or times of change without strong scholarly “methodological or conceptual rigor” (Capoccia & Kelemen, 2007, p. 342). In my analysis, I question whether the early 2000s can be seen as a time of a critical juncture for corporate philanthropic involvement in education in either country. As I detail below, with the PISA Shock in Germany and the growing popularity of CSR, including corporate philanthropy, it is an open question as to whether or not a critical juncture took place. Similarly, I question whether the passing of the No Child Left Behind and the after effects of it combined with new actors in philanthropy in education opened the door for major changes in the ways American companies invested in education. Most importantly, in both instances, if there was a critical juncture, I seek to find out why corporate philanthropic actors made the decisions they did.

According to Capoccia and Kelemen (2007), critical junctures are defined “as *relatively* short periods of times during which there is a *substantially* heightened

probability that agents' choices will affect the outcome of interest." In this definition, "relatively short" period of time refers to a period of time that is brief in comparison to the length of time of the path-dependence process it initiates. "Substantially heightened probability" refers to the choices of agents during this time having a higher chance of affecting the outcome of interest than before or after this period of time (p. 348). Similarly Hillel David Soifer (2012) argues that critical junctures must have permissive conditions "or those factors or conditions that *change the underlying context to increase the causal power of agency or contingency and thus the prospects for divergence*" (p. 1574). People tend to think of every country as having its own education system, an institution that is so bound by culture and history that it is almost impenetrable to change without having an enormous event. This may result in identifying an event or series of events as a critical juncture that led to changes without applying a rigorous method of establishing causality.

Capoccia and Kelemen (2007) lay out four components that could add some methodological rigor to the analyses of critical junctures. They start off with the need to be clear with the unit of analysis because what may be a critical juncture for one institution may not be for another even though they are closely linked. Next they advocate being specific with time frames and note that the briefer a critical juncture is with respect to the path-dependent process it kicks off, the more critical the juncture is. Capoccia and Kelemen further emphasize the need to focus on contingency and the idea that just because substantial options for change were available and could happen, does not mean that they will happen. The emphasis here is on the need for the selection of an option to be contingent during a critical juncture even if that means choosing to stay the course during a time when many other options could have been selected. Lastly, they argue for the importance of paying close attention to the decision making process of key influential actors. In this light they argue that a critical juncture analysis should reconstruct the decision making process to identify influential decisions and potential options in relation to the people who were actually making them (i.e., their motivation, connection to others in the process)(pp. 349-359).

In another article on critical junctures, Hillel David Soifer argues that there are essentially two types of causal conditions at work in a critical juncture- the permissive and the productive. The permissive conditions described above include the easing of

structural restraints so that change can happen. The productive conditions produce the outcome(s) that are reproduced even after the permissive conditions have gone away and the critical juncture time comes to an end. In order for it to be a critical juncture, the productive conditions need to happen while the permissive conditions are occurring. Soifer argues that analyzing these conditions separately makes analysis of critical junctures more precise. Like Capoccia and Kelemen (2007), Soifer also notes that permissive conditions in themselves are not enough to warrant a critical juncture—just because the opportunities for change are available, does not mean the change will happen. In analyzing a critical juncture, it is important to consider the critical antecedents or “the factors or conditions preceding a critical juncture that combine in a causal sequence with factors operating during that juncture to produce a divergent *outcome*” as they will help to identify how things were before they diverged. The key difference between the critical antecedents and the permissive conditions is that the critical antecedents were present before the critical juncture happened. Lastly, Soifer argues that what makes a critical juncture critical are the resulting mechanisms of reproduction or the way that outcomes are able to continue well after the critical juncture. (pp. 1574-1577, quote pp 1576+1577).

While Soifer agrees with Capoccia and Kelemen about the need for more methodological approaches to proving critical junctures, he disagrees with the need for them to be contingent and argues that the focus should be on divergence (Soifer, 2012, p. 1593). Slater and Simmons (2010) argue that critical junctures do not need to be contingent but that considerable focus should be given to causal critical antecedents and the long-term divergent outcomes that are produced. According to them, critical junctures rarely happen in a vacuum but occur as the result of preceding causal factors; which are instrumental in understanding why the critical juncture took place. Accordingly it is important to systematically analyze what happened before a critical juncture and on the divergence during the critical juncture. Here the big question to ask is “how were my cases similar before they diverged, and how were they different before they diverged (pp. 888-890, quote p. 911). It is not possible to understand why corporate philanthropic actors made the decisions they did without understanding the economic, education, and philanthropic context directly preceding this time.

In the table below, I have outlined my assumptions regarding potential critical junctures in the two countries based on Soifer's analysis of what should be present in a critical juncture. Below the table I articulate my assumptions and questions.

TABLE 2.1: CRITICAL JUNCTURE ASSUMPTIONS IN GERMANY AND U.S.

Element	Germany	USA
Critical Antecedent	Decrease in high quality dual vocational training candidates, concerned about workforce	Corporate Philanthropy long involved in education but not seeing results. Also concerns about workforce shortages
Permissive Condition	PISA Shock- education players. CSR movement and growth in foundations.	NCLB- data reporting and increased awareness of inequalities in education and failing schools. Opened the door for more actors. Caused concern about education system
Productive Condition	Increase in new corporate foundations funding education and in impact-based funding	Shift from old funders to new and their venture approach (i.e.; Gates), competitive advantage philanthropy
Outcome	Corporations giving to education philanthropically but part of more liberal foundation sector and being active outside of dual vocational training	Shift from funding schools to nonprofits and more national advocacy efforts and more of a focus on diversity
End of CJ	Uncertain	Uncertain
Mechanism of reproduction	Corporate Philanthropy partner with political elite, other foundations, creation of new NPOs, coalitions for education and others	Uncertain
Consequence	Corporate Philanthropy actively engaged in general education, opens door for continued involvement	Corporate Philanthropy funding initiatives more aligned to their competencies and needs

Applying these critical juncture insights to the United States, the enactment of NCLB could be seen as a permissive condition of a critical juncture. Some scholars see annual reporting of the percent of schools failing to meet their student achievement targets as a major turning point in education. This lead the public to increasingly see

the public schools as failing and created an unprecedented role for the federal government in public education (see for example: Ravitch, 2010, Chpt 6; Reckhow, 2013a, pp. 16-22). As corporations started to have access to data about the performance of schools, it may have impacted the way they invested in education.

The productive conditions could include the shift from “old” top funders in education such as Carnegie, Rockefeller, and Ford to “new” funders such as the Bill and Melinda Gates Foundation, the Walton Family Foundation, and the Eli and Edythe Broad Foundation.⁸ Their hands-on approach to education funding and the belief in the need for advocacy may have influenced the entire philanthropic field. This was especially the case for the Gates foundation after 2005 when it shifted from the small schools movement to a broad scale reform movement. (Hess, 2005b, pp. 5-9; Reckhow, 2013a, pp. 140-144; Reckhow & Snyder, 2014). Although there were shifts towards policy advocacy among foundations, most foundations still supported schools or school districts (Greene, 2005; Hess, 2005a) but some research since then has shown that the percent of funds going to schools has decreased considerably (Reckhow, 2013b). The top receivers of the most K-12 education foundation funding are nonprofit organizations (NPOs) with very few school districts even in the top 50 list (Foundation Center, 2013a).

Included in the productive conditions is also the trend for corporate philanthropy to be more aligned with the company itself and to be used towards to competitive advantage (Porter & Kramer, 1999, 2002). These trends in philanthropy may have led to corporate philanthropy making significant steps towards investing in education nonprofits instead of schools. It may have also resulted in corporate philanthropy taking on some of the same approaches evident in general philanthropy such as a focus on advocacy and outcomes-based impact measures. Here I hypothesize the critical antecedent was that corporate philanthropy had long been involved in education initiatives but they were not seeing the impact they had hoped for and that there were concerns about the workforce because they were not seeing improvements in education outcomes.

⁸ Here forth referred to as the Gates, Walton, and Broad foundations

What is not clear are the types of initiatives that large corporations funded in K-12 education before the early 2000s and if their approach to funding changed significantly during the critical juncture time. Based on what was happening in private philanthropy, my hypothesis is that they too were funding initiatives in schools and districts directly but that during this time, they started to shift to a model of funding nonprofits and engaging in advocacy around K-12 issues; thereby, creating new alliances among other foundations and nonprofit organizations and government leaders. This laid the ground for the STEM movement to take place a couple of years later.

While I have quite clear hypotheses for some aspects of the critical juncture, there are some aspects for which I have little to no information to base a hypothesis on; therefore, they remain as open questions. For example, it is not entirely clear when the end of the critical juncture time was. Establishing the end of the critical juncture is necessary in defining whether one took place because the shorter the time frame, the more critical it is (Capoccia & Kelemen, 2007, pp. 349-359). The end could be marked by the production of a new stable institution (Soifer, 2012, p. 1591). In this case, the new institution and mechanism of reproduction could be a new way for corporate philanthropy to engage in education. I am not certain what this would entail as there is no research available on the role of corporate philanthropy in education during this time period. It is also necessary to assess what changed before and after the critical juncture (Slater & Simmons, 2010, pp. 888-890).

To show there has been a critical juncture and why corporate philanthropic actors made the choices they did during that time, each of the elements outlined above needs to be defined. As a note, I am not arguing here that all of my hypotheses need to be correct but that in order to determine that there was a critical juncture, all of the elements must be present. Due to the open questions I have, it remains an open question whether corporate philanthropic involvement in education experienced a critical juncture in the early 2000s. This will be addressed in my interviews and resulting analysis.

Similarly, the reporting of the results of PISA 2000 in Germany resulted in the so-called PISA Shock (see for example: Hartong & Münch, 2012; Martens & Leibfried,

2007; Niemann, 2010). The time thereafter could be seen as the permissive conditions of a critical juncture for corporate involvement in education. The movement in philanthropy in general to be more strategic and to take on characteristics of venture philanthropy in Germany (Adloff, 2010, p. 413; Mair & Hehenberger, 2014) could be seen as productive conditions. An additional productive condition may be the formation of many corporate foundations in the early to mid 2000s, several of which had education as a focus area (Junck, 2007, pp. 36-37). The critical antecedents could be that less students are opting for dual vocational training. German companies have long had a large role in education through the dual vocational training system (see for example: Thelen, 2004, p. Chapter 2) However, there has been an increase in the percent of students going to Gymnasium. Some of the higher-performing students who would have traditionally attended Realschule and continued with a vocational route started attending Gymnasium (Nikolai & West, 2013, pp. 61-63). This left the corporations with a decreasing pool of higher-achieving students for their vocational training programs and may have raised the interest of corporations in improving K-12 education. I propose that the formation of new corporate foundations and the new interest of some corporations in K-12 education resulted in a mechanism of reproduction. By creating new institutions and alliances among foundations, nonprofit organizations, and government leaders, they were able to continue their work in education.

Lastly, it is not evident what would mark the end of the critical juncture period. As in the U.S., it could be the production of a new stable institution or the reverse case of the beginning of the critical juncture (Soifer, 2012, p. 1591). In this case, the new institution would be a new way for corporations to engage in education, beyond their role in the vocational system or the creation of new coalitions of foundations and corporations with the goal of influencing education policy.

As with the American case, I am uncertain if a critical juncture took place between 2000 and 2014 but I plan on looking for each of the elements of a critical juncture outlined above. I have some questions about the potential the end of the critical juncture and in the American case, about the mechanism of reproduction that I have no way to even predict how they might be answered. Therefore, I leave it as an open

question as to whether a critical juncture took place and why corporations and their foundations behaved as they did. I will address these questions in my interviews.

As described above both countries seemed to have many of the conditions necessary for a critical juncture but there are still many unknowns during this time frame with respect to the decision-making and influencers. If there was not a critical juncture, it may be the case that there were incremental changes that led to transformational change, which as Streeck and Thelen note is the most likely route of change (2005). Through my research, I will establish whether either or both of the countries experienced a critical juncture and why corporate philanthropic actors made the decisions they did at that time.

Regardless of whether a critical juncture took place in corporate involvement in education or if it was a series of incremental changes, it is important to briefly emphasize the histories of corporate involvement in education in the two countries before the early 2000s⁹. I assume their histories impact their paths to their recent involvement in the STEM and MINT education movements; which I describe below.

Germany has long been known for its dual vocational training approach to vocational education, which, involves students going to formal schooling that is related to their field part-time while simultaneously working as an apprentice. This form of coordinated vocational training is considered “collectively organized” because of the involvement of firms, intermediary associations, and the state, which all work together in the process of initial vocational training. In these systems, firms are heavily involved in the financing and actual administration of the training. Intermediary organizations such as unions or employer associations are also involved in the administration and ongoing reforms of the training. Trainees receive portable, certified occupational skills, and the training itself takes place in both schools and companies (Busemeyer & Trampusch, 2012, pp. 4-6). There has been significant evolution in the German system of vocational training but it is based on legislation that dates back to the late 1800s (Thelen, 2004, p. Chpt. 2).

⁹ Note: much more on this in the historical chapter

Meanwhile business involvement in corporate philanthropy via the creation of corporate-related foundations (unternehmensnahen Stiftungen) in Germany has a long history. However, there has been tremendous growth in the number of corporate foundations in the last twenty years. Recently founded corporate foundations are much more like the American style of corporate foundations (Unternehmensstiftungen). They are seen as part of CSR and maintain a tight relationship with the corporation (Adloff, 2010, p. 375; Junck, 2007, pp. 16-30; Mecking, 2010). Education is a priority, with 17 percent of corporate foundations identifying it as a main cause that they support (Junck, 2007, pp. 8-9) but the support for K-12 education seems to be more recent.

The U.S. has the opposite situation with limited to no business involvement in the public school vocational system. There is a long history of corporate involvement in education through corporate foundations and corporate leadership weighing in on K-12 issues.

The United States is considered to have a “liberal skill formation” system where skill training happens largely through markets and in the general education system. Students usually receive a generic secondary education; they may do internships or have summer jobs. Upon graduation and finding a job, they participate in specific on-the-job training. There are also some public vocational programs; however, they have a lower status than the general or academic tracks. This leaves higher-level vocational training to community colleges or trade schools where students have to pay for their training and there are limited linkages to the labor market (Busemeyer & Trampusch, 2012, p. 13). Thelen traces the characteristics of the U.S. vocational preparation model back to several factors including the lack of guilds, mass immigration from multiple countries, and high levels of mobility in the early industrial years, the movement to mass production with standardized skill sets, and a focus white-collar management of industry production (Thelen, 2004, pp. 177-184).

While U.S. businesses have had limited involvement in public education through vocational training, there has been a strong tradition of corporate involvement in education through foundations. After World War II and with the onset of the GI Bill aimed at funding veterans in college, several large corporations worked together to

support private colleges that were struggling financially (Himmelstein, 1997, p. 19; Sharfman, 1994, p. 254). Since then corporations maintained a larger interest in higher education initiatives. But in the 1980s, after the release of the Nation at Risk report and at the prodding of the Business Roundtable, many large corporations started to support K-12 initiatives. The percentage of corporate education donations to K-12 education almost doubled in the late 1980's and early 1990s (Himmelstein, 1997, p. 28).

As described above, the corporate involvement in education in the U.S. and Germany have very different historical paths; however, I propose that corporations and corporate foundations have made significant changes since 2000. This has resulted in some isomorphism in their involvement in K-12 education, with the STEM and MINT movements as examples of this. More specifically, I hypothesize that in Germany, companies and their foundations have started funding K-12 initiatives focused on better preparing youth for the workforce as a way to maintain their influence in education. This is due to the decreasing interest in dual vocational training from both companies and students and an ever smaller student population. In the U.S., I propose that corporations and their foundations, which have long been active in broad education issues have narrowed their interests. They started funding STEM education to address the specific long-term workforce needs they are concerned about. Included in this are some steps towards funding vocational education because of shifts in the U.S. economy, which require more middle-skill jobs (i.e., require more than a high school diploma but less than a BA) and difficulties with school-to-work transitions. The STEM and MINT education movements with their focus on in-demand knowledge and skill areas and their high degree of corporate involvement are ideal for studying the changes in corporate involvement in education outlined above. I argue that these changes did not happen overnight but were part of institutional transformation processes.

Institutional transformation process include: path stabilization (marginal changes), path departure (gradual but significant changes), or path switching (totally changed institutions) (Ebbinghaus, 2009, pp. 201-202). Building on the path departure, Streeck and Thelen argue that incremental changes that happen after the initial critical juncture lead to “gradual transformation.” This can happen through several processes

but of most interest are the displacement and layering processes of gradual transformation. In a displacement process, a subordinate institution starts to have inroads through the active cultivation of a new logic inside an institution. In a layering process, new elements are layered on an existing institution and eventually the new fringe starts to take away from the core of the institution (Streeck & Thelen, 2005, pp. 19-27).

German companies and their foundations that are active in supporting MINT education still have substantial investments in the vocational education system to train significant portions of their workforces. This has not changed but investing through philanthropy in more general education initiatives is a way of layering on to their current education involvement. Also in Germany, as new ideas in the ways for philanthropy to invest in a way that is more outcomes-driven and hands-on is changing the logic of how they do invest in education from investing directly in schools to investing in nonprofit and advocacy organizations. Similarly, in the U.S., where corporations have long supported K-12 education but often through giving directly to schools, I assume a layering process has taken place in the sense that many of them still do support schools directly but that many of them now support nonprofit and advocacy organizations as well. I see this also as a displacement process because once a company or its foundation start to fund nonprofits, especially advocacy organizations, there is a new logic at play. The logic changes from investing in schools to help them out to investing in organizations that will change the schools.

Each of these processes can become transformational because once they become a part of the institution, it is often hard to go backwards because of what Paul Pierson (2000) refers to as increasing returns. In this sense each step along a particular path emboldens the direction of the path. In collective political processes, he argues that the consequences of the actions of one actor are highly dependent on the actions of other actors. When deciding to start a new political entity, whether a political party, a nonprofit, or a group dedicated to an issue, there are considerable startup costs in terms of organizing, networking, fundraising, and coming to agreement on issues. Once the new institution is up and running, it is more likely to be continued rather than always looking to create a new one. Put in other words, “As social actors make

commitments on existing institutions and policies, their cost of exit from established arrangements generally rises dramatically” (Pierson, 2000, pp. 257-259, quote p. 259).

Research from scholars of philanthropy in education in the U.S. have noted that although there are major shifts towards policy advocacy among foundations, most foundations still directly support schools or school districts (Greene, 2005; Hess, 2005a). Some research has shown that the percent of funds going to schools has decreased dramatically (Reckhow, 2013b) and that most of the receivers of K-12 education foundation funding are no longer schools or districts but nonprofit organizations (Foundation Center, 2013a). For general philanthropy the reasons for increasingly investing in nonprofits instead of schools include: wanting to avoid the bureaucratic nature of schools and districts that make their programs difficult to implement, a desire to change what is happening in education rather than continuing to support a system they do not believe in, and the belief that public education already has enough resources (Greene, 2015, pp. 11-13). Although corporate philanthropy has long supported education, it remains unknown if they have also started to shift away from funding schools directly towards funding more education nonprofits. I hypothesize however that this is happening with corporate philanthropy too for the same reasons as general philanthropy. For corporate philanthropy however, there are additional benefits because investing in larger national education nonprofits also give them additional visibility and because they can use these nonprofits as ways to push for educational policies that may benefit them in the long run. In Germany, I argue that corporations and their foundations have started to fund more general education initiatives but increasingly with a focus on nonprofit organizations, while still keeping their regular investments in vocational education. In the U.S., I argue that general education initiatives are still being funded and are the main types of initiatives corporate philanthropy contribute to; however, there are starting to be inroads to vocational education initiatives. I argue that there is a growth in funding non-profit organizations, some with national reach, in both countries as opposed to the traditional funding of schools or their booster clubs directly. Path departure theory will be helpful in assessing if and how corporate philanthropy made small but significant changes to their approaches to education in both countries.

In sum, I assume that the involvement of corporations in education in the United States and Germany are path dependent in nature and affect the decisions companies make with respect to philanthropic engagement in education. More specifically, that decreases in the participation of companies and students in Germany's vocational education program has resulted in companies starting to fund general education initiatives, such as MINT education. In the U.S., where corporations have not been heavily involved vocational education but do have a long history of engagement in general education, a changing economy that requires more middle-skill jobs in STEM related fields has led to the use of philanthropy for STEM and related vocational education initiatives. I also propose that the last decade has seen a gradual transformation underway from traditional forms of education philanthropy characterized by giving directly to schools and school programs to trying to influence education policy through giving to NPOs. As mentioned above, it remains unclear if a critical juncture took place in one or both countries but I assume that institutional transformation processes have taken place since the early 2000s and have made the MINT and STEM movements possible.

Ideas towards Change in Path Dependent Models

Path dependency theories are helpful in identifying the reasons institutions are able to survive in one form or another over time and how decisions are bounded by choices and other factors of the past. They are less helpful in understanding what causes them to change. Historical institutionalism offers a theoretical approach for understanding the multiple forces that have influenced policymaking but it does not provide a way to explain the content of policy choices. For that, a theory of ideas is necessary. When considering events that alter the path of an institution, it is important to consider the role of ideas because they are helpful for understanding the motives of the actors, as well as, the strategies they perceived as best for accomplishing their goals (Mehta, 2010, pp. 26, 30). This is especially the case when considering how policies develop because the flow of ideas between the state and societal actors can really enhance our understanding (Hall, 1993, p. 289).

According to two well-known ideational scholars, Daniel Béland and Robert Henry Cox, ideas are causal beliefs that are developed in our minds and connected to the

“real world” through our interpretations of our environment. They help us form links between things and between people and provide us with blueprints for action (2010, p.3). A key feature in ideational theory is the focus on the interpretations or the perceptions of interests. Unlike rational choice theories that emphasize that actors behave in ways to maximize their self-interests, ideational theories focus on the construction of the perceived interests of the actors that drive their behavior (Berman, 2013; Hay, 2011, pp. 72-74). Part of understanding perceived interest is understanding what has happened in the past and how that influences the perception of actors today. In this respect, an understanding of how corporate philanthropists in both Germany and the U.S. came to the idea that improving STEM and MINT education was in their best interests and how that builds on their involvement in education in the past is required.

One type of idea is a “policy paradigm” or a problem definition, which, results when most actors have adopted a common definition of a problem and it is tough to argue with. It changes the way the actors view the world (for more on ideation, see: Béland, 2007; for definition see: Hall, 1993, p. 279; Mehta, 2013, pp. 18-23). A policy paradigm can also be seen as a set of ideas held by a group of people within a policy community (Daigneault, 2015, 49). While policy idea literature often takes for granted the development of a problem definition and how it was established, it is important to determine how problem definitions are defined and why one problem definition prevails over another (Mehta, 2010, pp. 32-33; Schmidt, 2010, p. 55). Using a policy paradigm framework the connections between ideas and the amount of actual policy change can be shown (Daigneault, 2015, p. 43).

According to Jal Mehta (2013) policy paradigms can affect the political landscape in three ways. First, they change the discourse in a way that may bring together several agendas that earlier would not have been associated. In this light, they may also exclude policy ideas that do not go along with the new narrative. Next, policy paradigms also change the actors involved by bringing new formations of actors together and causing some traditional alliances to be broken. Basically those actors with aligned views about the problem will be included, those who disagree will be excluded. Some actors will strategically align their views and actions to go along with the policy paradigm to be included. Lastly, policy paradigms open the door for major

institutional change as they can cause institutions to view their responsibilities with a completely different lens. “In sum, once crystallized, a new paradigm not only delimits policy options to conform to that paradigm but restructures the political landscape around an issue, raises the agenda status of the issue, and changes the players involved, their standing to speak, and the venue in which the issue is debated” (Mehta, 2013, pp. 19-20, quote p.23).

Jal Mehta’s (2013) analysis of the major federal education policy changes in the U.S. in the late 1980s through the early 2000s exemplifies how policy paradigms can shift education policy. He argues that after the Nation at Risk report, which warned of a “rising tide of mediocrity” in the public schools, the need to reform education was framed as an urgent economic issue. This was the case for both democratic and republican policymakers, two Presidents (Bush and Clinton), multiple business groups, and many education organizations including a teachers’ union. The framing ultimately allowed the federal government a larger role in education. Standards-based reform emerged as the winning solution among these groups because of its appeal to the liberal factions who were concerned with equity and to the conservative groups because of its potential for enforcing accountability in education. This also put the teachers unions on the defensive as the accountability movement tended to emphasize the need for educators to be more accountable for producing measurable results. Overtime, the ideas around the role of the federal government in public education shifted dramatically from a “hands off” role to one that reached every school. The institution of federal involvement in education changed accordingly with the passing of the *No Child Left Behind* Act in 2001 (Mehta, 2013, Chapter 8).

In arguing for better ways to measure policy paradigms, Daigneault (2015) outlines four dimensions that must be present in any policy paradigm: (1) ideas about the current state of the problem and the role of the state, (2) a belief that the problem requires some type of public intervention, (3) concepts of policy goals that should be pursued, and (4) ideas about how to achieve the goals through policy. He argues not only that each of these dimensions be present but that there be change in all four of them within a specific time period. Also that the ideas of the actors within the policy community be internally consistent or at least compatible and are widely shared within this community. Lastly, he argues that in order to prove whether a

paradigmatic shift happened or not, it is necessary to focus on the actual policy changes; which may include new laws, statutes, guidelines, or even smaller changes (pp. 50-53).

I argue that companies and their foundations were facing a new paradigm of education failure in the wake of NCLB in the U.S. and PISA in Germany and the many general reforms proposed to address. In addition, they were also facing a philanthropic community with an ever increasing push to be more strategic and a corporate culture that emphasized the use of philanthropy as a competitive advantage (see more on this below). To address all of these concerns, a “sub-policy” paradigm of needing to improve STEM and MINT education emerged. Both still addressed educational failure but in areas most important and strategic for companies. I refer to it as a “sub-policy” paradigm because it is a spin-off of the original policy paradigm of educational failure.

Close attention to the development of ideas can advance our understanding of why corporate philanthropy of many large companies on both sides of the Atlantic chose to focus their efforts on the sub-policy areas of STEM and MINT education. If indeed sub-policy paradigms did take place, based on Daigneault (2015), I would expect to see: (1) an assumed problem definition with little to no dissent: that the question is not if we need more or better STEM and MINT education but how to best go about fixing it. (2) The belief among corporate philanthropic actors and others that improving STEM and MINT education needs public intervention to propel it forward. (3) That there is agreement among actors within the education policy community regarding the education policy goals that are appropriate. (4) Shared ideas about how to achieve the goals of more and better STEM and MINT education.

Analyzing this as sub-policy paradigm also allows for analyzing if the acronyms STEM and MINT were used to alter the discourse to bring together multiple agendas. Special attention and detail to the development of the policy paradigm over time will help to explain if companies, their foundations, and other actors were able to start to transform the institution of corporate engagement in education. I would expect it to be aligned more with the needs and expertise of the companies. Lastly, to prove if a sub-policy paradigm took place, I would expect to see actual policy changes and an

increase in funding from the state for STEM and MINT education.

In recognition of the fact that ideas do not come out of nowhere, it is also important to analyze where ideas actually come from and potential influencing factors. Daniel Béland (2007) shows how differing policy paradigms along with electoral competition led to changes in Social Security (SS) between 1935 and the early 2000s. SS was originally based on fiscally conservative actuarial assumptions. Changes in beliefs about the need to protect the family unit along with electoral competition for President Roosevelt led to a conversion of SS. It went from strictly a social insurance model to a redistributive model that protected traditional family roles. Later in the 1960s and early 1970s, social security benefits were greatly expanded as it became seen as a “retirement wage.” A new actuarial paradigm allowed policymakers to use projected instead of actual windfalls in their calculations of benefits. This allowed for an immediate increase in benefits without tax hikes. Again, electoral competition, this time for President Nixon, helped to usher these changes in. Lastly, in the 1990s, although there were no major legislative changes to SS as in the other two phases, there was a changing financial paradigm that stressed the need to increase individual investment and responsibility over government’s responsibility in retirement policy. Although this paradigm has not been enough to shift to the complete privatization of social security, it has been very influential in the creation of a second stream of retirement savings plans that are private (401K plans for example). These tax-reduced plans have and continue to minimize the role of SS by through a layering process (Béland, 2007).

As the Béland analysis above demonstrates, close attention to the ideas of those involved in institutional change is necessary in comparing why one type of policy change takes place over another. It also emphasizes the importance of factors other than ideas, in this case, electoral considerations on policy. In the case of corporations and their foundations deciding to fund MINT and STEM there are likely many factors that influence these decisions.

Just as Béland’s research focuses on factors that influence the development of ideas, here I focus on three types of factors: overall, international, and national. An overall factor that influences ideas is the need to be legitimate. Legitimation explanations of

institutions assume that actors reproduce an institution because they believe it is the right thing to do. Changes in the beliefs and preferences (which are forms of ideas) of the actors lead to institutional transformation (Mahoney, 2000, pp. 523-525). In order to understand why institutions change their beliefs or preferences it is also necessary to understand both the environmental changes that were happening simultaneously and factors that remained unchanged (Streeck & Thelen, 2005).

Corporate philanthropy must maintain its legitimacy across several organizations such as the company and its shareholders but also multiple actors of the societal sector of interest (Himmelstein, 1997, pp. 3-6). In my research, I hypothesize that corporate engagement in STEM and MINT education in the U.S. and in Germany is seen as legitimate because most of the corporations themselves are economic leaders in these fields. For example, a large technology company has legitimacy in STEM education because it produces technology products and has a lot of engineers and information technology (IT) employees. As a result, it is seen as possessing expert knowledge in what is needed for these fields.

Marcel Mauss's (1925) essay on giving in which he analyzes gift exchange processes in archaic societies is helpful in analyzing the ideas that drive philanthropic giving even today. In his work, he shows that all gifts come with societal strings attached. The giver always expects something in return and the receiver feels he must give something in return for the gift, thus creating a cycle of giving, taking and repaying of gifts. There are basically two types of giving cycles. He found the strongly antagonistic cycle evident in the potlatch of the Indian Societies of the American North-West. The giving is about a fight of reputations with the cycle of gifts escalating in societal value over time. In this scenario giving always sparks return-giving to maintain honor. In the less antagonistic giving in Melanania's *kula* (inter- and intra-tribal commerce) giving and repaying the gift and the cycle thereafter is more about building profitable partnerships (Mauss, 2011 [1954, 1925]).

Frank Adloff's book on the history of foundations in the U.S. and Germany draws on Mauss's theory of giving, concluding that the similarities and differences in philanthropic activities in the two countries are based on the type of social connections; either solidaristic or antagonistic. If the public perceives foundations to

be acting in a potlatch or aggressive manner, the societal and political realms will be critical of the role of foundations. Adloff found that in the U.S. in the 20th century, there were often debates about the legitimacy of foundations; where as, in Germany over the last decades, foundations were perceived as having a legitimate role in society but that perhaps with critical tests of their legitimacy in the future, they too will be subjected to the skeptic views evident in the U.S. (Adloff, 2010, p. 417). The works of Mauss and Adloff open many questions about how corporate philanthropy perceives the cycle of giving in relation to education institutions and how they perceive their involvement is viewed in society. Given the many more controversial education issues such as teacher evaluation or charter schools, I assume that corporations perceive their giving to STEM and MINT initiatives as being of the less antagonistic variety.

This theme of legitimacy is also tied to Corporate Social Responsibility (CSR). Defined loosely, CSR “consists of clearly articulated and communicated policies and practices of corporations that reflect business responsibility for some of the wider societal good”(Matten & Moon, 2008, p. 405). According to Archie B. Carroll (1991) corporations have four types of responsibilities to society: economic (make money), legal (obey the law), ethical (do the right thing), and discretionary (philanthropy- be a good corporate citizen¹⁰) (Carroll, 1991, pp. 39-40).

In a comparison of the U.S. and Europe, Dirk Matten and Jeremy Moon (2008) argue that CSR is embedded in four types of institutions in a nation- in their political, financial, education and labor, and cultural systems. In the U.S., CSR is embedded in a system with plenty of opportunities for corporations to take on social responsibilities for some societal interests resulting in an “explicit” style of CSR. In Europe however, CSR has traditionally been couched in systems of broader organizational responsibility for social needs through heavy involvement of the state and more cross-sector coordination, leaving fewer chances for corporations to take on explicit social responsibilities. In Europe “implicit” CSR “normally consists of values, norms, and rules that result in (mandatory and customary) requirements for

10 There are debates about the use of the term “corporate citizenship” as Carroll uses it in this way but that is beyond the scope of this theoretical chapter. (For a more expansive theoretical argument against using corporate citizenship in this way, see: Matten & Crane, 2005).

corporations to address stakeholder issues and that define proper obligations of corporate actors in collective rather than individual terms.” Matten and Moon further argue that “explicit” CSR is gaining traction across Europe because of changes in the four types of institutions mentioned above and isomorphic pressures on the corporations themselves (Matten & Moon, 2008, pp. 407, 415-417, quote 409).

The differences in the way CSR is practiced and shifts in CSR globally towards a more “explicit” form, likely impacted the ways companies are involved in STEM and MINT education. More specifically, I assume that because Germany’s traditional system of corporate involvement in dual vocational training appears to be in decline, explicit CSR initiatives in MINT education are seen as a way to continue to be helpful in educating the next generation. In the U.S., I assume that the growing frustrations regarding skill shortages drove companies to play the role of supporting STEM and vocational education initiatives. I further hypothesize that more explicit CSR is also resulting in a shift towards investments that come with more recognition such as funding large nonprofit organizations instead of schools themselves.

The development of policy paradigms can also be influenced by ideas at the international, national, regional, and local-levels. Because this research is a comparison at the country-level, I focus on some international and national level ideas and contexts that may have influenced corporate philanthropy to invest in STEM and MINT education.

At the international-level, there are traveling education reforms or reforms that surface in different parts of the world (Steiner-Khamsi, 2012, p. 3). Organizations such as the Organisation for Economic Co-operation Development (OECD) have spread ideas about best practices in education policy and made ties to economic competitiveness. It is seen as an outside expert, can bring a set of popular reforms to a global stage, and has been seen by some as a step towards global education governance. In this light, improvements in education performance are seen as a way towards a better economy. Education systems are increasingly exposed to outside pressures, measures of accountability, and efficiency using exams such as PISA, which is administered by the OECD (Hartong & Münch, 2012, pp. 5-7; Meyer & Benavot, 2013, pp. 11-14, 20-21). “The rise of the OECD as an influential soft power

in global education policy and global education governance is linked to the ‘economization’ of education policy and what we might see as the simultaneous ‘educationizing’ of economic policy, all linked to the growing significance of the skills agenda for the OECD across multiple directorates” (Sellar & Lingard, 2013, p. 191). The influence of the OECD and more specifically PISA is not felt in all parts of the world equally. While the results of PISA 2000 were followed by a “shock” in Germany, they were barely noticed in the U.S. (Niemann, 2010; Olano, Knodel, Martens, & Popp, 2010).

Martens and Niemann (2013) argue that the international ratings and rankings that result from an exam such as PISA resonate in a country when the subject tested is seen as a critical part of the national discourse. When there is a gap between a country’s self-perception of their educational abilities and the results demonstrated by the ratings and rankings there is also more awareness. They argue that while Germany had this enormous public awareness in 2000 as it regards PISA, the U.S. started to respond in 2010. It remains an open question if the international results and rankings of the OECD and other organizations actually affected the way companies were involved in education in the U.S. or Germany and more specifically if it drove them to be more involved in MINT and STEM education. One could argue that in Germany because of an over awareness of PISA that the science and math results had an effect on companies deciding to invest in MINT but on the other hand, one could also argue that it did not effect their decisions because they had their own ways of assessing the education situation based on new workers entering the labor market. In the U.S., international results will likely have a minimal role because the Americans typically do not pay much attention to international rankings. Also, as in Germany, U.S. companies would likely be able to assess real skill and knowledge shortages based on their interactions with the labor market.

Also at the international-level, Germany’s membership in the European Union (EU) and the influence of the EU education initiatives and policies could also influence the ways corporations view their engagement in education. As an example, the EU’s 2010 Education and Training program included a target to increase the percent of university students with a degree in math, science, or technology by 15 percent (European Commission, 2014). In order to achieve this, students in the K-12 schools

would need to increase their interests in these disciplines. Whether or not these EU initiatives impact the ideas of corporations and their foundations in Germany regarding how they give to education is an open question. It depends how closely corporations follow these programs and how or if corporations are included in reaching these goals by their host countries.

The OECD is just one of the growing organizations in what Meyer and Ramirez refer to as “The Rise of an Internationalized Educational Sector” in the long-term global standardization process of education. Here, they theorize that education systems are becoming more homogenous because international educational organizations have more influence them. The degree to which educational systems change is tied to the degree of participation of the nation-state in world society (Meyer & Ramirez, 2003, pp. 119-128, quote p. 126). In that light, there are international influencers in philanthropy. Organizations such as the United Nations and the World Economic Forum have developed initiatives to encourage companies to invest in social issues such as education. Some of these initiatives have thousands of companies as members (Bhanji, 2016, pp. 420-421). It is unclear of the internationalization of education and philanthropy effected the decisions of corporate philanthropic actors to become active in STEM and MINT.

Another example of an international influencer, is the European Venture Philanthropy Association (EVPA). It is an international organization that advises European foundations on ways to increase their societal impact through venture philanthropy characteristics. This includes “high engagement, tailored financing, multi-year support, non-financial support, involvement of networks, organisational capacity-building and performance measurement” (European Venture Philanthropy Association, 2014). In their study of the interactions between traditional philanthropist and venture philanthropists (VP) in Europe between 2006 and 2012, Johanna Mair and Lisa Hehenberger (2014) show how traditional foundations who were initially opposed to the ways of VP are now working with VP, have adopted common methods, and share ambitions. They further hypothesize that traditional philanthropy’s ability to shift in this direction was a result of the management gurus and consultants of the past decade who had introduced “strategic philanthropy” and other similar concepts to the field (Mair & Hehenberger, 2014, p. 1195). Frank Adloff

also mentions this growing trend in the German foundation sector over the last few years towards conditional giving, inter-organizational reciprocity, and the conversion to venture capital like giving (Adloff, 2010, p. 413). I assume that corporate philanthropy in both the U.S. and Germany are also influenced by these venture philanthropy trends and as a result are also actively involved in projects they are funding by lending their expertise while at the same time being very clear about the metrics of success they expect to see.

While the ideas driving international policy are important in the comparison of corporate philanthropic interests in education so is the local policy context. “Focusing on the understanding of local policy context against the backdrop of larger transnational or global developments should be a prominent feature of comparative education” (Steiner-Khamsi, 2012, p. 4). It is critical to find out more about what is actually happening at the local level to find out what a global policy on the ground actually looks like. Sometimes a policy may be the same in name but have major differences in actual policy and implementation. As an example, consider the “adapted” education models for African-Americans in the Southern United States in the early 1900s that were applied to Africa, indigenous people in the Pacific, and ultimately to Cyprus. Heavily financed by American foundations, these models advocated for the adaptation of education to the perceived limited intellectual abilities of these populations towards manual and agricultural skills. Many of the countries involved had officially adopted policies consistent with “adapted” education. In reality however, these policies were rarely fully implemented and in some cases outright rejected by local authorities because they saw them as offering little opportunity for advancement for their people (Steiner-Khamsi, 2003). Education policy regarding STEM or MINT education is a global phenomenon. This research goes deeper to the national-level factors to find out more about what is actually happening with respect to corporate philanthropic engagement in education in these disciplines and by taking country specific factors into account.

An influencer of ideas at the national level is the overall public philosophy or zeitgeist; which, “is a disparate set of cultural, social, and economic, assumptions that overwhelmingly dominate in public discourse at a given time” (Mehta, 2010, p. 40). For example “big government” is bad or “low taxes” is always good. In his research

on the standards-based accountability movement in education in the United States, Jal Mehta shows that there were similar movements taking place simultaneously in law, medicine, higher education, and other fields. Overall the public had lost confidence in private and public institutions because of an increase in the knowledge available to the public. This led to “greater consumer, market, capital, and state control over the professions” (Mehta, 2013, pp. 118-123, quote p. 122). In other words, trends in education were part of a larger public philosophy about public and private fields of service. When studying the idea development of foundations in education, an understanding of the overall public philosophy in both countries is also required. I assume that the financial crisis of 2008 caused many companies, their foundations and other actors to tighten their belts and to refocus their efforts on initiatives and programs with more of a direct economic impact. STEM and MINT education as opposed to arts education would allow companies to give to education while at the same time preparing youth for these in-demand fields. Parents and students, whom, as a result of the financial crisis, may have become more focused on education tied to good job prospects, would also look on these investments favorably. In essence that a cultural shift that favored science and math education over other subjects also played a role in the development of ideas for corporate philanthropic actors.

Research also plays a role in the formation of policy ideas at the national level but close attention must be paid to the types of institutions that are most influential in each country. Both Germany and the United States have decentralized forms of governance with governing decisions happening at multiple levels, thereby offering plentiful opportunities for input from external actors. The U.S. however has a liberal market economy where economic decisions are mainly tied to the market, and made independently by corporate leaders without consulting other organizations. This contrasts with Germany’s coordinated market economy where economic activity is structured through vast non-market relationships and networks, as well as, state intervention and regulations. The combination of decentralized forms of government and the types of economy affect the types of research units that are most prevalent in each country. Scholarly units have scholars and professional researchers, tend to be non-partisan, often produce high-quality academic work, and may be publically or privately funded. Advocacy research units are privately funded, often politically and ideologically partisan, and focused less on scholarly research but on the dissemination

of their ideas. Party research units are closely aligned with a specific political party providing expert advice and analyses for party members. Scholarly and advocacy units dominate the U.S. research scene and for both, there is generous philanthropic funding. More funding has gone towards advocacy in recent years; resulting in a field that is highly competitive for media attention and increasingly partisan in nature. The majority of Germany's research units are scholarly and party research units. Scholarly units are funded mainly through public funding with the consensus nature of the political structure making their policy recommendations more tempered (Merai, Metzner-Kläring, Schröder, & Sütterlin, 2011, see also: Campbell & Pedersen, 2010).

In the case of corporate philanthropic engagement in education policy endeavors, the prominent ideas of research units will help in understanding why particular lines of ideas take hold in each country. More specifically, are their advocacy or scholarly research organizations in the U.S. that have impacted the decisions of corporations and their foundations to fund STEM education? In Germany, did any of the party political research organizations play a similar role regarding MINT education? If so, which ones? What were their main messages and how are these messages different?

In sum, I assume both countries were facing a new “policy paradigm” of educational system failure in the early to mid-2000s as a result of the PISA results in Germany and the ever increasing list of failing schools under the NCLB rules. Simultaneously, the ideas about how corporations should use their strengths in their philanthropic approach towards a competitive advantage, and the funding approaches of private foundations were becoming more dominant (more on this below). I theorize that the new policy paradigm, the new ideas regarding the “best practices” in philanthropy, and many other overall, international, and national influencing factors led to a “sub-policy” paradigm of needing to improve STEM and MINT education. Although the STEM and MINT movements look strikingly similar from the outside, I assume key cultural differences will emerge by attending to the influencers of ideas at the overall, international and national levels as described above.

An understanding of the development of this “sub-policy” paradigm will be helpful in explaining the developments of STEM and MINT education initiatives by the corporate communities in both countries. It is also important, however, to understand

what they actually did with these ideas and how they worked together. For that I now turn to institutional entrepreneurship.

Institutional Entrepreneurs

I assume that corporate philanthropy acted as institutional entrepreneurs in the STEM and MINT education movements, consistent with Paul DiMaggio's description that "new institutions arise when organized actors with sufficient resources (*institutional entrepreneurs*) see in them an opportunity to realize interests that they highly value" (DiMaggio, 1988, p. 14). Other scholars have also used this theoretical basis when explaining the philanthropic behavior of foundations in education (see for example: Quinn et al., 2013; Thümler, 2014). My focus here is on the foundations and philanthropic engagement of the top companies in each country and their involvement in STEM and MINT education. As some of the most prosperous companies in the world with both economic and political resources at hand and often a strong interest in education, there is no empirical research on their activities in the field of public K-12 education.

Drawing on DiMaggio's theory on institutional entrepreneurship, Ekkehard Thümler (2014) describes three components to institutional entrepreneurship; mobilizing resources, developing discursive strategies, and bringing together new groupings of stakeholders (see also: DiMaggio, 1988, pp. 14-16; Leca et al., 2008). In the literature in the U.S., there is an emphasis on the "new" donors in education. The distinction of "new" is to distinguish them from the traditional top funders of public education such as the Rockefeller, Carnegie, and Ford foundations. But this sense of "new" is also used to describe their approach to funding education initiatives, their entrepreneurial backgrounds, and the vast amounts of money they have. These characteristics have led to a new style of education philanthropy among the major donors; which include Gates, Broad, and Walton. They are known to have more of a hands-on approach to "investing" in education initiatives and an emphasis on leveraging their funds by focusing on education policy. In this light, they can be seen as institutional entrepreneurs (Clemens & Lee, 2010; Hess, 2005b, pp. 297-301; Reckhow, 2013a, pp. 140-144; for more detailed theory on foundations as institutional entrepreneurs see: Thümler, 2014). Foundations acting as institutional entrepreneurs in education is not a new concept; however to date, there has not been a clear understanding if corporate

philanthropy is also playing this role in STEM and MINT education.

Taking the component of mobilizing resources from above, foundations in the U.S. have been working on strategies to leverage their relatively minimal resources to channel public budgets in new directions in order to cause systemic change. This is not at all a new concept, as the Ford Foundation did this in high school reform in the 1950s and the Carnegie Corporation had several education related commissions on the quality of teaching and other education topics (see for example: Hess, 2005b, p. 2; Schneider, 2011, pp. 29, 107,). It is a shift compared to the last couple of decades when foundations tended to fund school and district initiatives directly. They did not involve themselves as much in political endeavors aimed at education resources (Clemens & Lee, 2010; Hess, 2005b, pp. 5-6; Reckhow, 2013a, p. 41; Reckhow & Snyder, 2014, pp. 187-188). I assume that corporate philanthropic actors are also trying to leverage their investments to encourage more state funding of STEM and MINT education.

The next component of bringing together new groupings is a role that foundations also use towards major systemic change in education. As institutional entrepreneurs, corporate foundations see it in their interest to bring together many stakeholders in new ways. In this light, Pia Gerber's case study (2006) describes the Freudenberg Stiftung's ability to bring together multiple actors from business, politics, the state, the media, nonprofit organizations, and education practitioners around a common education project. One of her main points is that corporate foundations¹¹ can be active in all three major sectors: the state if they are working for change in the area of education, the private sector because of their business origins, and the nonprofit sector because of their foundation status as a nonprofit and their ongoing relations with other nonprofits. Similarly, in their pivotal paper, Michael E. Porter and Mark R. Kramer (2002) argue that businesses are ideally situated to address some of the world's most pressing problems and corporate philanthropy¹² could increase a company's

11 Note: The Freudenberg Stiftung would not be considered a corporate foundation for the purposes of this study as it was founded by the Freudenberg family, it is a *Unternehmensnahe Stiftung* or in an English translation, a foundation that is close to the business but not a part of it.

12 As a note, corporate foundations are just one type of corporate giving or corporate philanthropy and usually considered a part of Corporate Social Responsibility. In the U.S.

competitive advantage. According to them, companies with philanthropic endeavors that are aligned to improving their competitiveness are best suited to identify the strongest grantees, bring together other funders, improve the performance of grant recipients, and to put the best practices into wide-spread use (Porter & Kramer, 1999, 2002). They also serve as a bridge for the company into many other areas of society, again giving them more influence (Adloff, 2010, pp. 396-398; see also: Gerber, 2006, pp. 17-18). I hypothesize that corporate foundations are leading the charge in the MINT and STEM education movements and in doing so are bringing together many actors including corporations, foundations, nonprofits, and policymakers.

In their discursive strategies, institutional entrepreneurs try to frame the problem, develop a common language, and raise awareness of the issues and possible solutions (Leca et al., 2008, pp. 11-14). Some of these characteristics are also a part of advocacy; which refers attempts to influence government and other institutions. Major tactics include: “high-level lobbying, media work, public education campaigns, protests and other forms of direct action...” (Clark, 2010, pp. 12, 15). Sarah Reckhow (2013) noted how much has changed in education philanthropy because of major foundations giving away more money, their open involvement in advocacy, and their business-style of targeted giving (p. 27). In an analysis of giving by the Gates Foundation, she finds that they gave more than 40 percent of their education grant funds directly to school districts in 2000. By 2010 that share was 15 percent while the share going to national policy advocacy and research grew more than seven fold from roughly two to 15 percent (Reckhow, 2013b). Similarly, based on the survey results of 184 foundations that give grants for K-12 education purposes, 61 percent said they give grants to influence public policy with 34 percent planning to give more funding for public policy initiatives and 0 percent planning to decrease in this area (Grantmakers for Education, 2011). Elisabeth Clemens and Linda C. Lee pointed out that since the fiscal environment of the 1980s, philanthropists have gone from a partnering with government model to an influencing government model by bringing together powerful actors to push for “more extensive adoption and systemic transformations” (Clemens & Lee, 2010). Similarly I propose that companies and their

Corporate foundation giving accounts for 35 percent of corporate giving with the rest of corporate giving going directly to charities through direct cash, services, and/or goods (Clemens & Lee, 2010).

foundations are raising awareness of MINT and STEM education issues and using the acronym MINT and STEM as a way to bring multiple groups together under one umbrella.

In sum, I propose that corporate philanthropic actors acted as institutional entrepreneurs in STEM and MINT education. They perceived it to be in their best interest to leverage some of their limited funds towards policy changes in education. To do so, they brought together STEM and MINT actors from several different backgrounds and also from different academic disciplines. The use of the word STEM and MINT was a critical step for corporate philanthropy in building a discursive strategy and framing the policy issue of the need for improving and increasing education in these disciplines. I assume that key differences in ideas and path dependent decisions will greatly affect the institutional entrepreneurial role of corporate philanthropy in education, leading to major differences in approach.

Summary of Theory

In this chapter, I have detailed why historical institutionalism is ideal for analyzing the development of corporate philanthropic involvement in education in the U.S. and Germany. To this end, I have tried to show how path dependence theories with their emphases on the analysis of institutional, political, and cultural factors overtime will be critical in explaining the similarities and differences in corporate philanthropic involvement in education more recently. In essence, practices of corporate philanthropy in the area of K-12 education in the two countries can be partially explained by the roles of companies and past decisions in education. I add further that it appears that NCLB and PISA may have been turning points for corporate philanthropic involvement in education but that it remains unclear if either of these events truly represents a critical juncture. I am hopeful that my research can help to answer this question and provide a detailed analysis of the ways corporations were engaged in education overtime in the two countries as a basis for understanding how they have since engaged in STEM and MINT education.

I propose that despite their traditional and very different roles in education, companies and their foundations have made significant changes over the last decade. This has resulted in some isomorphism across the two countries in their involvement in K-12

education. To analyze why corporate philanthropy in education has changed, I focus on STEM and MINT education in the U.S. and Germany respectively. For a better understanding of how corporate philanthropy in both countries came to see STEM and MINT education as worthy of their investment, I rely on ideational theory. I assume that a “policy paradigm” of educational system failure in both countries in the early 2000s led to a “sub-policy paradigm” of needing to improve MINT and STEM education. At about the same time, new ideas about corporations using their philanthropic endeavors towards their competitive advantage and the growing use of advocacy among private foundations (especially in the U.S.) changed the way corporate philanthropy viewed their approach to education. Here the focus of my research will be about how ideas about how corporate philanthropic involvement in education developed and what the major influencers were in the STEM and MINT education movements.

An understanding of the development of this “sub-policy” paradigm will be helpful in explaining the developments of STEM and MINT education initiatives by the corporate communities in both countries. It is also important, however, to understand what they actually did with these ideas and how they worked together which is where institutional entrepreneurship comes in. I assume that that companies and their foundations brought together many actors to propel the issue of needing to improve STEM and MINT education to the forefront of education policy discussions. Their discursive strategy of using a single-syllable, four-letter acronym played a big role in attracting additional actors and interest in the topic. I assume however that key differences in ideas and the path dependent decisions of companies will explain the differences in their institutional entrepreneurial role.

Chapter 3: Methodology

Overview

The methodology consisted of four major components: (1) identification of companies and their philanthropic interests in education, (2) interviews of leaders/top personnel of corporations responsible for philanthropic activities and corporate foundations, (3) analysis of the information from the interviews using Qualitative Content Analysis, and (4) analysis of relevant documents and secondary literature to check the answers of the experts or provide additional context.

Identification of Companies and Education Interests

When starting my research on corporate philanthropic giving in education in Germany and the U.S., I initially wanted to find out which top companies were involved in K-12 education and what specifically they were funding. To start I analyzed the education giving of the top ten companies of the Global Fortune 500 List from 2012 in both countries (see Table 3.1). I used this list so that I could have a comparison group of companies and because if they are in the top ten companies in terms of revenue, they are likely big name companies with wide recognition.

TABLE 3.1: TOP TEN U.S. COMPANIES BY REVENUE FOR 2012

2012 rank in U.S.	Company Name	2012 ranking in fortune 500	Type of Company	Total revenue in 2012 in \$ Millions
1	Exxon Mobil	2	Oil and Gas	452,926
2	Wal-Mart Stores	3	Retail	446,950
3	Chevron	8	Oil and Gas	245,621
4	ConocoPhillips	9	Oil and Gas	237,272
5	General Motors	19	Automotive	150,276
6	General Electric	22	Technology	147,616
7	Berkshire Hathaway	24	Finance/Banking	143,688
8	Fannie Mae	26	Finance/Banking	137,451
9	Ford Motor	27	Automotive	136,264
10	Hewlett-Packard	31	Technology/IT	127,245

Source: (Fortune Magazine, 2012a, 2012b)

TABLE 3.2: TOP TEN GERMAN COMPANIES BY REVENUE FOR 2012

2012 rank in Germany	Name	2012 ranking in fortune 500	Type of Company	Total revenue in 2012 in \$ Millions
1	Volkswagen	12	Automotive	221,551
2	E.ON	16	Electric Utilities	157,057
3	Daimler	21	Automotive	148,139
4	Allianz	28	Insurance/finance	134,168
5	Siemens	47	Engineering/Electronics	113,349
6	BASF	62	Chemical	102,194
7	BMW	69	Automotive	95,692
8	Metro	72	Retail	92,746
9	Munich Re Group	76	Insurance	90,137
10	Deutsche Telekom	89	Telecommunications	81,554

Source: (Fortune Magazine, 2012a, 2012b)

For each of the top ten companies, between November 15th 2013 and January 15th 2014, I analyzed their websites and webpages related to corporate giving to assess if they gave to K-12 education and which types of initiatives they funded.¹³

As seen in the table 3.3, of the top ten companies in the U.S., seven have foundations. Interestingly, two of the companies had foundations but have recently closed them. Of those foundations, five (yellow) support elementary and secondary education initiatives. Chevron and Conoco (in green) do not have foundations but they support elementary and secondary education through other corporate giving endeavors.

¹³ Methodology in appendix.

TABLE 3.3: CORPORATE PHILANTHROPY ACTIVE IN EDUCATION, U.S.

Company Name	Foundation Name (if different)	have a foundation	Foundation focus on elementary and secondary	elementary or secondary education as focus	Higher education focus	international EI + Sec education focus
Exxon Mobil	ExxonMobil Foundation	1	1	1	1	1
Wal-Mart Stores	The Walmart Foundation	1	0	0	0	0
Chevron	Chevron Global Fund	1	0	1	1	1
ConocoPhillips	foundation discontinued	0	0	1	0	1
General Motors	GM Foundation	1	1	1	1	0
General Electric	GE Foundation	1	1	1	0	0
Berkshire Hathaway	no foundation	0	0	0	0	0
Fannie Mae	foundation discontinued	0	0	0	0	0
Ford Motor	Ford Motor Company Fund	1	1	1	1	1
Hewlett-Packard	Hewlett Packard Company Foundation	1	1	1	1	1

Sources: Webpages of companies + foundations accessed between November 15, 2013 and January 15, 2014

Note: Yellow= corporate foundation that supports elementary and secondary education, Green= corporate giving that supports elementary and secondary education, and White= no giving to elementary and secondary education.

In Germany, nine of the ten companies had foundations, six of these companies had at least one foundation with a focus on elementary and secondary education.

Interestingly, two companies, Allianz and BMW had more than one foundation and in both cases, more than one foundation with an interest in education. Also, Volkswagen,¹⁴ E.ON, BASF and Metro groups did not have foundations that focused on elementary and secondary education but they all had corporate initiatives that did.

¹⁴ Although there is a well-known and well financed Volkswagen Foundation that does support education initiatives, it is not a corporate foundation. It was created when Volkswagen went from being a fully state-owned institution to a public company listed on the German stock exchange but has not retained ties to the company itself (Volkswagen Stiftung, 2017).

TABLE 3.4: CORPORATE PHILANTHROPY ACTIVE IN EDUCATION, GERMANY

Name	Name of Foundation	have a foundation	Foundation focus on elementary and secondary	elementary or secondary education as focus	Higher education focus	international El + Sec education focus
Volkswagen	No foundation*	0	0	1	1	1
E.ON	E.ON Stipendienfonds	1	0	0	1	1
Daimler	Daimler und Benz Stiftung	1	1	1	1	0
Allianz	Allianz Kulturstiftung, Allianz Umweltstiftung, Allianz Foundation for North America und der Stiftung Allianz Direct Help	4	2	1	1	1
Siemens	Siemens Stiftung	1	1	1	0	1
BASF	BASF Stiftung	1	0	1	0	
BMW	BMW Foundation Herbert Quandt, Eberhard von Kuenheim Stiftung	2	2	1	1	1
Metro	Metro-Foundation Sculpture Park	1	0	0	0	1
Munich Re Group	Munich Re Foundation	1	1	1	1	0
Deutsche Telekom	Deutsche Telekom Stiftung	1	1	1	1	0

Sources: Webpages of companies + foundations accessed between November 15, 2013 and January 15, 2014

Note: Yellow= corporate foundation that supports elementary and secondary education, Green= corporate giving that supports elementary and secondary education, and White= no giving to elementary and secondary education.

That the corporate philanthropy efforts of these Global Fortune 500 companies invested in education in both countries was hardly a surprise given research about corporate philanthropy overall; which shows that education is a main focus area (Braun, 2010; Committee Encouraging Corporate Philanthropy, 2016; Foundation Center, 2012; Junck, 2007). The question I further sought to answer however is what types of endeavors in elementary and secondary education they were investing in. To do this, I analyzed the web pages of the foundations and corporate giving programs of the corporations that were giving to K-12 education.

In the United States, of the five corporate foundations with elementary and secondary education as a focus area, all five supported Science, Technology, Engineering, and Mathematics (STEM Education Coalition) initiatives. Additionally, four of the five supported teacher professional development which was often but not always aligned with the STEM initiatives. When the corporations without a foundation who give to education through corporate giving initiatives were included, seven of the ten

supported STEM education and six supported teacher professional development initiatives.

TABLE 3.5: THEMES¹⁵ SUPPORTED BY U.S. CORPORATE PHILANTHROPY

Company or Foundation Name	types of elementary and secondary education activities							
	STEM	Common Core	Teacher PD	Teacher Training	Early Edu	Turnaround	school management	other
ExxonMobil Foundation	1	0	1	1	0	0	0	0
GM Foundation	1	0	0	0	1	1	0	1
GE Foundation	1	1	1	0	0	0	1	1
Ford Motor Company Fund	1	1	1	0	0	0	1	0
Hewlett Packard Company Foundation	1	0	1	1	0	0	0	1
Chevron	1	0	1	1	0	0	0	0
ConocoPhillips	1	0	1	0	0	0	0	1
Totals	7	2	6	3	1	1	2	4

Sources: Webpages of companies + foundations accessed between November 15, 2013 and January 15, 2014

In Germany, of the six companies with foundations that support elementary and secondary education initiatives, four supported early childhood initiatives and teacher professional development initiatives. MINT and environmental education initiatives were each supported by two of the foundations; however, when the companies that support education initiatives outside of their foundations were included, four supported MINT and three supported environmental education. Also, when these companies were included, the number supporting early childhood education increased to five and for teacher professional development, it increased to six. As with the U.S., the teacher professional development was often aligned with their areas of focus such as MINT and environmental education.

¹⁵ Columns explained: Common Core refers to support for common core standards initiatives, teacher PD refers to teacher professional development initiatives, teacher training refers to teacher preparation initiatives, early edu refers to initiatives that support early childhood activities before formal schooling starts, Turnaround refers to initiatives for turning around the lowest performing schools, school management refers to initiatives aimed at principals and overall school management and leadership. As a final note, the findings above are based on an analysis of the webpages and available web documentation of the companies and corporate foundations featured. They may support additional initiatives not featured on their webpages or initiatives they do not feature publically. This is an analysis of the information the companies and their foundations displayed to the public.

TABLE 3.6: THEMES SUPPORTED BY GERMAN CORPORATE PHILANTHROPY

Name of Foundation	types of elementary and secondary education activities						
	MINT	Environmental Education	Early Ed	Teacher Preparation	Teacher PD	School Management	Other
Volkswagen*	0	0	0	0	0	0	1
E.ON Stipendienfonds	1	1	1	0	1	0	0
Daimler und Benz Stiftung	0	0	1	0	0	0	0
Allianz Kulturstiftung, Allianz Umweltstiftung, Allianz Foundation for North America und der Stiftung Allianz Direct Help	0	0	0	0	0	0	1
Siemens Stiftung	1	0	1	0	1	0	0
BASF Stiftung	1	0	0	0	1	0	1
BMW Foundation Herbert Quandt, Eberhard von Kuenheim Stiftung	0	1	1	1	1	1	1
Metro-Foundation Sculpture Park	0	0	0	0	0	0	1
Munich Re Foundation	0	1	0	0	1	0	0
Deutsche Telekom Stiftung	1	0	1	1	1	0	1
Total	4	3	5	2	6	1	6

Sources: Webpages of companies + foundations accessed between November 15, 2013 and January 15, 2014

Based on this analysis, I decided to focus on comparing the corporate philanthropic involvement of companies in STEM and MINT education in Germany. With six companies supporting teacher professional development in some capacity, I arguably could have focused on that. Teacher professional development was often tied to STEM or MINT however and I found it limiting not to look at the broader picture.

Expert Interviews

The STEM and MINT education movements are relatively new phenomena in both countries. As a result, not much is written about how the movements came to be and nothing is written about the role of corporate philanthropy in them. Expert interviews are ideal for gathering data about processes and information that is often not written about, such as background information, internal conflicts, connections between actors, and differing interpretations (Bogner et al., 2014, p. 2; Tillmann, Dederich, Kneuper, Kuhlmann, & Nessel, 2008, p. 79). In this sense, I rely on expert interviews to obtain information about why and how corporate philanthropy became active in STEM and MINT education.

In the historical chapter I was able to draw upon secondary research to compare the ways corporations and their foundations interacted with K-12 education in both countries between 1945 and 2000. Due to a lack of scholarly literature however, interviews were essential in establishing whether NCLB in the U.S. and PISA in Germany were critical junctures for corporate philanthropic involvement in education in the early 2000s and if these critical junctures paved the way for the STEM and MINT education movements.

In reactive sequence path dependency, it is necessary to identify critical junctures; which force actors to choose one pathway over other possible paths in order to proceed (Mahoney, 2000, pp. 526-527). Some scholars have argued however that more attention needs to be given to critical junctures, that they are not just a “time of change” (see for example: Capoccia & Kelemen, 2007; Soifer, 2012). For this reason, the expert interviews also had a specific sub-set of questions to establish if there was a critical juncture in either or both countries (see below). The interviews were also necessary to understand the perceptions of the actors and the development of the ideas that STEM and MINT education needed to be improved, as well as the reasoning for involvement from corporate philanthropy (for more on ideation, see: Béland, 2007; for definition see: Hall, 1993, p. 279; Mehta, 2013, pp. 18-23). They were also used to establish if corporations or their foundations were acting as institutional entrepreneurs in the STEM and MINT education movements and if so, which strategies they were using to advance their message, bring actors together, and mobilize resources (DiMaggio, 1988).

Experts are able to provide information about a particular topic of interest from their knowledge and experiences that cannot be obtained elsewhere. In this light, experts have privileged information about actors and decision processes and usually hold a high level of responsibility as it relates to these processes. Expert interviews are ideal for research like mine that is less focused on facts and more on reconstructing subjective interpretations (Bogner et al., 2014, pp. 2-4; Meuser & Nagel, 2010; Tillmann et al., 2008, p. 79). As witnesses to the discussions and decisions of interest, experts are themselves not the objects of the interview but are able to provide special and exclusive insights (Gläser & Laudel, 2010, pp. 12-13). According to the Merriam Webster Online Dictionary (2015), one with expert knowledge is someone “having or

showing special skill or knowledge because of what you have been taught or what you have experienced.”

Experts are not only solid in their knowledge but are actors that have used this knowledge in practice and can shine light on the actions and activities of other actors. (Bogner et al., 2014, pp. 12-14; Meuser & Nagel, 1991, pp. 443-444). They are most often not studying the topic but are experts because of their experiences and rarely see themselves as experts. They are also not always the big boss or executive but are often the second or third level down from the top of an organization but have exclusive knowledge and experience of specific topics (Meuser & Nagel, 1991, pp. 443-444).

It is also significant to note that experts are expert in their particular topic but they may not be expert at explaining it or may be selective in what they wish to share. They may also find the interview process uncomfortable, which may also affect what they say (Pfadenhauer, 2007, pp. 451-453) but there are ways for the interviewer to dampen this through the interview process (see more below on interview style). Individual expert interviews will not provide the absolute truth but interviewing many experts and using other sources (such as document analysis, see below) serve as ways to crosscheck individual interviews (Meuser & Nagel, 1991, pp. 466-467; Patton, 2002, pp. 306-307).

Expert Sampling Procedure

For this research 12 (6 in the U.S. and 6 in Germany) corporate philanthropy and STEM/MINT education movement experts were interviewed. They are composed of a mix of corporate philanthropic advisors, high-level employees of nonprofit organizations active in STEM/MINT, and high-level employees of top corporate foundations¹⁶ or philanthropic arms of companies active in STEM/MINT education. All experts selected were actively involved in corporate philanthropy and/or MINT and STEM education and have relatively high-level positions of authority within these fields and were selected because of the unique insights about how corporate

¹⁶ Top corporations are defined as being one of the ten highest valued companies on the Global Fortune 500 list of 2012 that give philanthropically to STEM/MINT education initiatives. In Germany this consisted of four companies total and in the U.S., seven companies total. The top companies at the top of this list were asked for an interview first.

involvement in STEM and MINT education developed (Gläser & Laudel, 2010, p. 117). The mix of interviewees was intended to provide differing vantage points on the role of corporate philanthropy in the STEM/MINT education movement.

To develop my initial sample of experts that would be most relevant to my research I met with and discussed my research with 2 researchers that study German corporate philanthropy, the co-director of corporate philanthropy of a major German insurance company, a project manager of a philanthropy consulting firm, a vice-president of a major U.S. corporation who is also active in the company's corporate philanthropy, and the leader of a U.S. based education think-tank that receives funds from corporate philanthropy. Most of the informational interview partners were also generous enough to connect me with the experts they recommended I interview. In an effort to keep the samples comparative and in line with my theoretical work, I interviewed experts from organizations that had functional equivalent missions and roles within these organizations where possible. Basically, one could say the sampling process was a mix of theoretical and snowball sampling. (see: Bogner et al., 2014, pp. 34-37).

TABLE 3.7: ORGANIZATIONS AND COMPANIES OF EXPERTS INTERVIEWED

Germany	USA
Nationales MINT Forum	Change the Equation
Deutscher Industrie und Handelskammertag (DIHK)	National Academies Foundation
Active Philanthropy	Jobs for the Future (JFF)
Siemens Stiftung	ExxonMobil Foundation
BASF	GE Foundation
Pilot interview: Generali Zukunft Fonds	Achieve, Inc.

Of the experts I reached out to, just two, both in the U.S, refused or did not respond to my requests for an interview. One was an organization that represents business interests in Washington and has been very active in STEM education and the other was an organization that advises corporations in their philanthropic giving. I substituted two other interview partners from other organizations that were recommended in my informational interview phase.

Interview Logistics

All interviewees received an email with a brief plain language exposé about my research, a note about why I wanted to interview them specifically, and a request for an interview (Gläser & Laudel, 2010, pp. 161-162). The interview questions and my hypotheses were not revealed to the interviewees in advance. All interviews¹⁷ were recorded using the Voice Memos or Rev application of an iPhone or an iPad and were conducted in-person, via Skype, or with on the telephone.¹⁸ Experts were asked for permission to record the interview and also promised that all of their responses would remain anonymous and that no identifiable information about them would be revealed (see: Bogner et al., 2014, pp. 31, 39-41). Interviews were mostly conducted in English however three of the six German experts were conducted in German and all German experts were told that it was OK to use German words or phrases if necessary. My first interview in Germany was conducted as a pilot interview for both the interview and coding processes and many of his insights about corporate philanthropy were ultimately included in the analysis.

Interview Questions

Interviews were semi-structured using a ten-question interview guide based on my theoretical chapter, historical chapter, previous knowledge and experiences, and my main research questions. The questions were grouped into three major theoretical themes in an effort to structure the interview. To make the interviewee(s) comfortable and to make the situation seem as normal as possible, the questions were asked in a flexible order and not all questions were identical but were asked in ways that flowed naturally and were neutral in nature. (see: Bogner et al., 2014, pp. 27-34; Gläser & Laudel, 2010, pp. 115-116, 135, 174; Patton, 2002, pp. 347-348). The interview guide was used as a way to be sure that the expert and I addressed the topics needed to answer my research questions and made me look more competent to the expert during the expert. It also helped me to avoid some of the common mistakes interviewers

17 In one interview the recording device stopped recording but I did not realize it until the end when I went to stop it. I immediately ran to a café and reconstructed the interview as fast as I could based on my notes. I then send the notes to the interviewee so she could review them for their accuracy and fill in the answers I was unable to recall.

18 Although I would have liked to do all of the interviews in person, time and geography did not always allow for it and some interviewees actually preferred to do telephone or Skype interviews. As Gläser & Laudel (2010) point out, telephone call interviews result in less control over the interview situation as the interviewee could also be multi-tasking and therefore not as engaged and because it is much more difficult to judge the emotions of the expert (p. 153) but I did not have a choice.

make, such as, the expert being off topic or taking the interview exclusively where he or she wants to take it (Meuser & Nagel, 1991, pp. 448-451). In some cases, due to time constraints and knowledge of the expert's areas of expertise, certain questions were left out.

The first theme of questions in the interviews tested whether or not a critical juncture in corporate involvement in education occurred in the early 2000s in Germany or the U.S. These questions were also aimed at finding out more about the types of changes that had occurred and why. Experts in both countries were asked about how corporate philanthropy had developed or changed in the last 25 years among the largest companies, what the major influences of these changes were, and how this specifically effected K-12 education. The goal here was to gain insights about how corporations and their foundations engaged in education before and after 2000 for a better understanding of the productive conditions and the actors involved and to see if experts named PISA (Germany) or NCLB (US) as a major event for corporate philanthropy. It was also to assess which factors (e.g., demographics, changing economy, school quality concerns) contributed to the changes seen in corporate philanthropic investments in education.

Regardless if the expert named PISA or NCLB, I asked each expert about the effects these events had on corporate philanthropic engagement in education. Again, in an attempt to assess whether a critical juncture occurred, I asked questions about the beginning and ending of corporate and corporate philanthropic awareness of PISA or NCLB. A critical juncture needs a beginning and an ending and the time in between should be a relatively short period of time in comparison to the existence of the institution itself. I also asked if and how companies and their foundations changed their approach to education in the immediate years after NCLB or PISA. As part of my probing questions regarding the effects of NCLB or PISA, where applicable, I also included a question about the actors involved at that time and how that changed immediately following NCLB or PISA. This was asked to get a clearer understanding about the actor constellations and how they may have led to the actor constellations later in the MINT and STEM education movements. To assess whether or not the changes in education involvement were contingent, I asked about other issues that

corporations and their foundations were interested in investing in at the time and how they landed on their investment in K-12 education.

The next theme of questions addressed ideational theory and if and how MINT came to be seen as a “sub-policy paradigm.” I asked each of the experts for their opinions on why the MINT or STEM movement appeared to really take off in 2008/2009¹⁹ and what spurred the interest of corporate philanthropy in MINT or STEM. The goal of this question was to obtain contextual information about how corporate philanthropic actors came to the idea of improving STEM or MINT education as being in their best interests. There were several probing questions to find out more about what they and others saw as the problem definition that underlies the MINT or STEM movement and why it prevailed over others. These questions included questions about why adolescent reading was not addressed and whether MINT or STEM education was seen as a form of improving the company’s competitive advantage. There were also several probing questions about who and what the biggest influencers in MINT or STEM education were at the overall, international, and national levels and if philanthropic trends towards more funder involvement and outcomes-oriented philanthropy effected their decisions.

There was also a probing question about the relationship of STEM or MINT education initiatives and vocational education training. In Germany, this was usually asked with some contextual data about the declining numbers of students opting for vocational education and if it impacted the decisions of companies to fund MINT education. I asked the U.S experts this question with some contextual references to large companies that recently invested in vocational education initiatives and if they saw growth in investing in these types of programs, especially within the STEM fields. This was a critical question to have a better understanding about how companies saw changes in vocational education affecting their decisions to invest in STEM or MINT education.

19 As preparation for this question and as my leading narrative on this question, I cited archive searches I did of Google, New York Times, and Frankfurter Allgemeine Zeitung, which showed huge growth in related articles starting in 2008/9. See Appendix for more information.

Another important aspect of identifying if a policy paradigm took place is to identify whether there was a change in discourse and if new constellations of actors were brought together. To get at this point, I asked how the acronyms MINT or STEM helped or hindered the ways groups of actors worked on education issues. By asking this question and some probing questions about who, I was trying to ascertain if the use of MINT or STEM themselves had developed a common language, framed the problem, and who was brought together as a result. I also asked if there were any groups that oppose the MINT or STEM education movements because policy paradigms ultimately develop into problem definitions with little to no descent. If the need to improve STEM or MINT education is the sub-policy paradigm I propose, then I would expect there to be little to no descent.

My last theme of questions was designed to test if corporate philanthropic actors were acting as institutional entrepreneurs. My first question in this line was if the interviewee thought that corporations or their foundations were at the forefront of the MINT or STEM education movements and if not, which groups were. The goal of this question was to find out whom they saw as leading this movement and if corporations and/or their foundations were just a part of the pack or playing a leading role in bringing together other actors.

A key part of being an institutional entrepreneur is to develop discursive strategies that frames the problem, includes a common definition and raises awareness of the issue and potential solutions. The discursive strategies and the framing of the problem were addressed in the previous subset of questions so in this section of questions I asked if in their opinions corporate philanthropic actors had done a good job of bringing awareness of deficiencies in MINT or STEM education to policymakers.

Another important aspect of institutional entrepreneurship is mobilizing resources. I assumed that corporate philanthropic actors are trying to leverage their investments in education by encouraging more state investment in MINT or STEM education. To test this hypothesis, I asked if there were MINT or STEM education initiatives that are now fully or partially state-financed that were started by corporate philanthropic actors and if so to give some examples.

My final question was an “anything else” question to encourage interviewees to tell me anything else they thought I should know or we did not address that they thought was important for me to know (Patton, 2002, p. 379). Although this was a fairly open question I wanted to be sure to ask it because I assumed that the experts I interviewed would have some valuable insights that I would not even think to ask about.

Interview Approach and Style

When interviewing experts, it is critical to decide on the style of the interview—the ways the questions will be asked and strategies for leading the discussion. Bogner et al. (2014) have a typology of the way the interviewer may approach the interview with roles such as the lay-person, critical, or co-expert style of interviewing with each having an affect on the information that is likely to be revealed (p. 49-55). For this research, I found Micheala Pfadenhauer’s (2007) quasi-expert interviewer style to be the most appropriate. Approaching the interview as a quasi-expert, the interviewer is able to engage the interviewee in more substantial questions related to the topic and once the interviewee recognizes the competence level of the interviewer, s/he is more likely to go deeper into the subject matter. It is important to note that this is not the same thing as a co-expert style; which, may cause the interviewee to sense a competence competition of sorts and become uncomfortable. The idea here is to be almost an expert but to let the expert that is being interviewed be the true expert. This also allows for the interview to seem more like a conversation to avoid the awkward feeling an interview situation often causes (pp. 454-456). Given my background in education policy and the substantial amount of historical research I conducted before the interviews, I felt comfortable taking on the quasi-expert interview-style.

Transcription

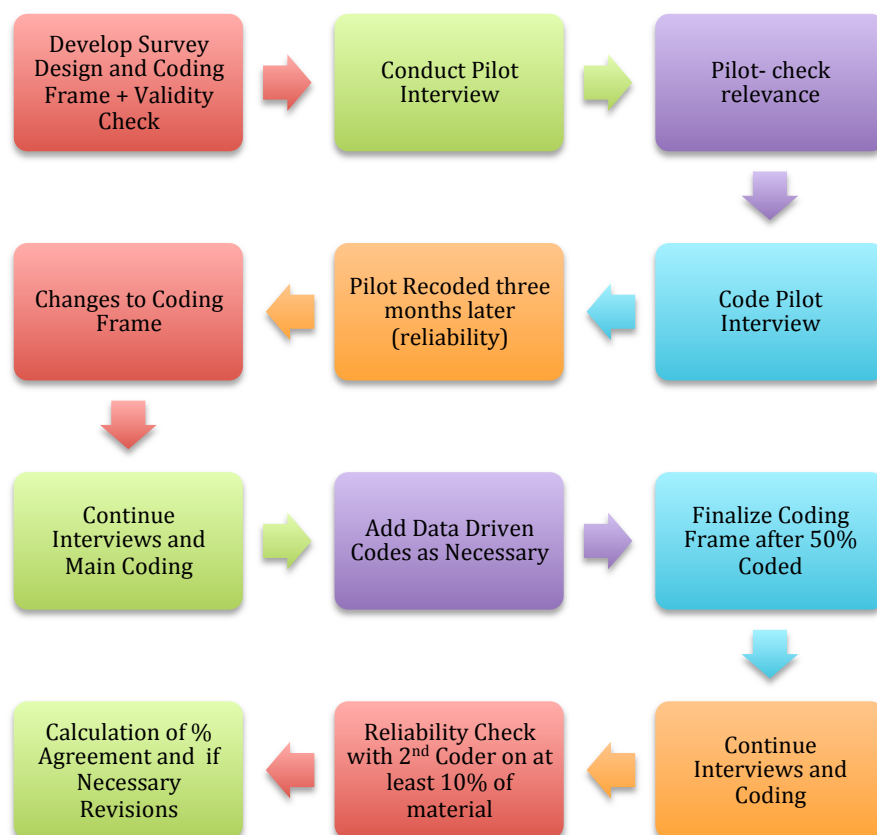
Recordings were transcribed using the transcript service Rev for all but the first²⁰ interview conducted in English. For the interviews conducted in German, I used the transcription service Mein Transkript. Upon receiving the transcriptions, I listened to the recordings, added the speaker code names to the transcription and checked for and corrected any errors in transcription.

²⁰ I transcribed the first English interview myself.

Analysis of Interviews

All expert interviews were coded using Qualitative Content Analysis (QCA), which “is a method for describing the meaning of qualitative data in a systematic way” (Mayring, 2010, pp. 11-13; Schreier, 2012, p. 1). QCA is ideal for material that must be interpreted such as data generated from interviews because it is a systematic way to reduce the volumes of data that 12 interviews generated. Through the development of a coding frame (see more below), I was able to focus on the aspects of the interviews that were most important for my research questions. Also, through the coding process, I was able to bring my individual interview data into a form that allowed me to aggregate across the data to find more meaning among the interviews. One can think of QCA as a mix between qualitative and quantitative analysis because it offers a way for preserving what is unique among interview responses while also providing a method of comparison. It is descriptive and focuses on how data relate to each other (Schreier, 2012, pp. 2-8, 31, 41).

FIGURE 3.1: DIAGRAM OF QCA CODING METHOD



Source: Self-designed figure of QCA methodology I used

Relevance of Data

Before any interview data was coded, I used a coding frame to decide which data was and was not relevant to the analysis. To do so, I coded the material with the following codes *relevant* and *irrelevant*. Relevant material was defined as material that addressed corporate philanthropy, vocational education, STEM or MINT education, K-12 education policy and associated actors. As a double check on the relevance of the data, I had researchers at a colloquium also code parts of the first interview for relevance to be sure I was not applying a bias in my analysis of what was or was not relevant (Schreier, 2012, pp. 81-84). Sections where there were disagreements were discussed but in general disputed sections remained in the analysis because it is better to err on the side of caution than to throw out data that could be useful later (Krippendorff, 2013, pp. 276-277 see section on unitizing; Schreier, 2012, p. 83). For all three interviews conducted in German, I translated just the relevant sections into English for coding purposes. All relevant data was coded using a coding frame.

Development of Coding Frame

A coding frame can be used to structure the data from interviews and to evaluate different meanings across the data. Based on the questions developed for the expert interviews, the theory being applied, the historical research, and my previous experiences, a concept-driven coding frame was developed for each main question before any interviews were conducted (see for example: Mayring, 2010, pp. 20-22). A concept-driven coding frame is a coding frame that is derived from “theory, previous research, from everyday experience, or from logic” (Schreier, 2012, p. 85). Below is a sample question and concept-driven coding frame from one interview question. As with the interview, the coding frame was divided into three sections to make the analysis more manageable (Schreier, 2012, p. 196).

TABLE 3.8: EXAMPLE OF CONCEPT CODING FRAME

Question 1: How has Corporate Philanthropy developed or changed among America’s largest companies over the last 25 years?		
1a Changes Overall	Category Name	Category Description
1a1	Professionalized	Since 1990s CP has become more professionalized- professional staff, not just accepting grant applications or at whim of CEO

1a2	Increased Funds	CP has remained largely the same but giving has increased
1a3	Decreased Funds	CP has remained largely the same but giving has decreased
1a4	Competitive advantage	CP is aligned to company goals overall, seen as a way to benefit company's profits
1a5	No change	CP has not changed since the 1990s
1a6	More Strategic	CP is more strategic, giving priorities are moving towards being focused on outcomes and measurements
1a7	Other	

Given the complex nature of this comparison and the 12 interviews, one may imagine that a purely concept-driven coding frame would be either impossible to develop or seriously flawed as there is no way I could predict all of the possible perspectives of the interviewees or the patterns between them. As a result, some codes were added in an inductive fashion (known as data-driven coding) as the interview data was analyzed and it became obvious that new categories or subcategories were necessary. As a result, the coding frames for both the German and the U.S. interview data were a combination of concept- and data-driven coding strategies (Mayring, 2010, p. 59; Schreier, 2012). Per the example above, the following cod was added, as a data-driven code after two or more interviewees gave similar answers that did not fit in the existing coding frame.

TABLE 3.9: EXAMPLE DATA-DRIVEN CODE ADDED TO FRAME

Data Driven Codes to question 1 above	Category Name	Category Description
	Strategic Desire	CP <i>wants to be more</i> strategic, giving priorities are moving towards being focused on outcomes and measurements

Overall Coding Process

Using the coding process described above, I coded the transcripts for each interview in an Excel sheet. The content-driven coding frame described above was developed in an Excel sheet with categories and subcategories for each question of the interview. Relevant quotes were copied or paraphrased from the Word transcript document of each interview and pasted next to the relevant category or subcategory along with

their line number in the transcript. Each interview had its own column and each country had its own Excel sheet.

A pilot interview was coded using the concept-driven coding frame so that I could work out obvious coding issues in advance of the main analysis. To do so, I coded the pilot interview first within days of doing the interview and then a second time, three months later²¹. This enabled me to identify categories of major inconsistency that needed clarification or adjustment. I then made the necessary changes to the coding frame. It also led to some changes in the interview questionnaire I designed (Schreier, 2012, pp. 146-150, 162).

As I coded the interviews using the concept-driven coding frame, it was clear that some data driven-codes were necessary. As a rule, if the answer to one of the interview questions did not apply to one of the categories, I placed it in the “other” category. If there were at least two similar answers from different interviewees in the other category, I created a new category. As the interviews were conducted, additional codes were added but because the interview questions were all quite similar, I was able to finalize my coding frame after analyzing 4 of the U.S. interviews and 4 of the German interviews. I determined that this was a good point to finalize the coding frame because there were no new codes to add or at least nothing that appeared multiple times and warranted a new code (Schreier, 2012, p. 91). According to Mayring, such a revision and finalization for a small scale study like this makes sense after 50 percent of the material has been coded (Mayring, 2010, pp. 84-85).

There are many different software packages that may have made the analysis easier or even allowed for more complex statistical analyses (Mayring, 2010, pp. 111-115; Schreier, 2012, pp. 241-242). However for my comparative research with just 6 interviews on each side of the Atlantic, I did not find it necessary to use one of these software packages and by not using one, it forced me to manually and repeatedly analyze the data, which I believe led to more insights and a deeper level of analysis.

21 Note: Schreier recommends the second coding to take place 10-14 days later. In my situation, this simply was not possible so I did it at a later time.

Reliability and Validity

Validity in QCA refers to the “extent that the categories adequately represent the concepts under study” (Schreier, 2012, p. 175) or in other words, does the coding frame address the research questions answered. Some telltale signs of a coding frame that does not match include high numbers of segments assigned to residual (or “other”) categories and high frequencies of one subcategory compared to another (Schreier, 2012, pp. 186-188). By creating a new category whenever at least two interviewees had a response that could be categorized similarly but the response did not fit into the original framework, I avoided the first telltale sign of a misaligned coding frame. The high frequency of one subcategory can also be explained by the distribution of themes in the interview, which can also be a finding.

One way to assess the validity of a QCA frame is to have an outside expert review the coding frame to ensure it aligns with the concepts it is meant to address (Schreier, 2012, p. 189). In this case, a professor reviewed the frame with me before I ever used it and assisted me in making revisions to make it more valid. She also recommended that I check my interview questions and all categories against my hypotheses, which proved to be very helpful in ensuring the alignment between them.

Reliability in QCA refers to the quality of the coding frame itself in its ability to yield data that is free of error. In this sense, reliability is not about the meaning of the data but whether or not researchers agree on the distinctions of the data (Krippendorff, 2013, p. 275). To establish reliability of my coding frame, I had another researcher code one of my interviews using the coding frame that I developed and refined with data-driven codes. To prepare for the reliability coding, I made sure that each category was clearly defined, especially from the perspective of someone who was not as involved in corporate philanthropy or MINT or STEM education. I highlighted all relevant units (see above for determination of relevant units of text) to be coded in the transcript and made a document with all relevant units listed under each question. I also provided him with the coding frame in an Excel sheet that included the codes from another interview as a sample. Lastly, I clearly explained the process. The researcher was asked to code the material using the same method I did (Schreier, 2012, pp. 166-169, 194-196) which he chose to do with a paper version of the Excel sheet.

The other researcher analyzed one of my longer interviews. Because second coders cannot code all of the material due to their own time restraints, it is advised that they check a minimum of ten percent of all material. By having a one of my longer interviews coded I ensured that close to 10 percent of all material was coded by a second coder (Schreier, 2012, pp. 195-198).

For each main category coded by the other researcher, a percentage of agreement was calculated using the following calculation based on the data coding results from me and the other coder (Schreier, 2012, p. 170).

$$\text{Percentage of Agreements} = \frac{\text{\# of coding units on which codes agree}}{\text{Total \# of coding units}} \times 100$$

Not everyone agrees with using the percent agreement calculation. For example, Klaus Krippendorff (2013) argues that such calculations are meaningless because they are highly dependent on the number of categories, whether unfilled categories are included in the calculation, and the number of coders. For example, if there are just two or three categories to select from and both coders select a different category, one could still claim to have 33 percent agreement. Similarly, using the same example with 5 categories and each coder selecting a different code for the same unit, the percent of agreement would be 60 percent. He also argues against all other calculations of agreement besides his own and demonstrates why his alpha coefficient is the best to use. Krippendorff also states however, that small sample sizes could lead to imprecision in the alpha calculation (pp. 277-280, 301-309), which from both the sample size aspects of my study and the number of coders is a problem. As a result, I used the percent of agreement calculation not as a way to determine absolute reliability but as a way to view the reliability in a range and to more easily identify areas of my data that were problematic.

The percentage of agreement was calculated for each main category, not for each subcategory within the main category using. Using the example above (see Tables 3.8 and 3.9), there would be eight subcategories (both concept and data-driven codes) and the results from all eight would be calculated into a percentage of agreement for the overall main category of Changes Overall. If the coder assigned a unit of coding

to the same category or if they left a category blank just as I did, it was considered to be an area of agreement. Given that there is tremendous variability within the degree of standardization and the overall number of codes analyzed, it is difficult to declare that a particular percentage makes something reliable or not. Instead, I discussed the results with the other researcher immediately afterwards to find out why certain categories were more or less reliable. In two instances, he did not understand the code meaning and once I defined it a bit better, he agreed. In another instance I collapsed two categories, for example “funding research” verse “funding awareness,” he argued that these codes should be collapsed into one because funding research is a part of funding awareness and it was difficult to separate the two. I agreed and collapsed the codes; however, I made changes to the coding frame only when absolutely necessary (Schreier, 2012, pp. 170-174, 199-201, 204-206). Our percentage of agreement ranged from 86 to 100%. All of the second coder’s coding and all related documentation were recorded on a separate Excel sheet that was printed out and has been saved for further reference.

Document and Secondary Literature Analysis

In addition to the reliability measures taken during the QCA, I also used documentary research to further corroborate or challenge the major findings of the interviews. Including data from sources such as books, journal articles, newspaper articles, reports, policy documents, and pamphlets provided important insights to my research. While the inclusion of these documents could be seen as biased or selective and are often themselves interpretations of events, not pure observation, I used them as a way check some of the main points of my interview research and to check some of the assumptions. To do this, I had to ask many questions about the source of the document and the original context and purpose of the document along with questions about the authenticity, credibility and representativeness of the document. Where appropriate, this is noted in the findings section. (Cohen et al., 2007, pp. 201-204).

Document analysis also served as a way for me to triangulate the data that came from my interviews and to be more confident in the findings and conclusions. It was not used, however to simply show that different data sources showed the same results but rather to test for consistency and to highlight the differences in findings across the data sources as a way to further reflect on potential reasons for the discrepancy. Also

because I asked the experts about reports and publications that may have influenced their decision making, there was valuable information that either further verified or contradicted the overall patterns in the answers of the experts (Patton, 2002, pp. 253, 555-556, 559-560).

For both the American and German cases, I used economic and education reports to check some of the assumptions of the expert interviewees. In the U.S., these included reports from the National Center for Education Statistics at the U.S. Department of Education, the U.S. Department of Labor, and the Congressional Research Service. These are all nonpartisan federal government institutions tasked with maintaining data and reporting on related topics. In Germany this included reports from the Federal Institute for Vocational Education and Training (known as BIBB), the Ministry of Education and Research (BMBF), the Federal Statistical Office (Destatis) and the Bildungsbericht (Education Report) from the Ministry of Education and Research and the Standing Conference of the Ministers of Education and Cultural Affairs (KMK). Similarly, with the exception of the KMK, these are federal level governmental institutions tasked with maintaining and reporting on their respective fields.

In addition to the governmental reports, I also included information from relevant speeches from President Obama or Chancellor Angela Merkel where they spoke about the importance of STEM or MINT education. Similarly I included information from legislative agendas, proposals, government regulations, budget proposals, and new laws where appropriate. These items were included to show some of the actual policy changes and proposed changes to STEM and MINT education.

I also referenced reports that the experts mentioned as being influential such as “Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future” (Committee on Prospering in the Global Economy of the 21st Century, 2007) and “The Opportunity Equation” (Carnegie Corporation of New York, 2009) in the American Findings. In the German findings I referenced a report called the “PISA 2006 Science Competencies for Tomorrow’s World” (OECD, 2007a). I did this for a better understanding of what these reports unveiled and the types of policy changes they were advocating for. Similarly, I also included information from reports, mission statements, and the websites of nonprofit

organizations active in STEM and MINT education such as Change the Equation, the STEM Education Coalition, the Business Roundtable, the U.S. Chamber of Commerce, the Nationales MINT Forum, and MINT Zukunft Schaffen. The idea here was to get a better idea of what their positions on STEM and MINT education were because of the heavy corporate philanthropic support of these organizations.

In an attempt to measure the public awareness of education topics, I conducted online archive searches in Google, the New York Times (NYT), and the Frankfurter Allgemeine Zeitung (FAZ). These searches were helpful before and after the interviews. I used all three sources before the interviews to assess when the acronyms MINT and STEM education became popular and used the time frame as part of my questioning around the timing of the movements. In NYT and Google I searched for “STEM²²Education” at various time periods from January 1, 2001 through January 1, 2015. Using the same time periods, I searched Google and the Frankfurter Allgemeine Zeitung (FAZ) for “MINT Bildung.” The data from the searches are included in Appendix B. After the interviews, I also conducted a search regarding PISA awareness because none of the experts I interviewed were able to answer my question about the end time of PISA awareness in the public sphere. To assess the prominence of “PISA” AND “Bildung,” I searched FAZ from January 1 through December 31 of each year from 2001 through 2016. The results are included in Figure 6.2.

In addition, at times to support or contrast the points the experts made, I also used relevant secondary literature sources. This was especially the case for some of the labor and workforce issues in the U.S. as these are extremely complex issues that already have experts with highly relevant points to this research. The same was true on the German side but especially with respect to the changes in the vocational training landscape.

22 Note: STEM as an acronym is used in many other English-speaking countries so the Google search may also reflect an interest in this topic from other countries too. The same can be said of MINT as both Austria and Switzerland also have MINT education initiatives; however, the difference is likely to be larger on the English speaking side because of countries such as India or the U.K. that have large populations. For this reason, the newspapers were also used as a source.

Representation of Results

Based on the results from the qualitative content analysis of my interview data and relevant information from documents and secondary literature, I wrote a findings section for each country before doing a comparative analysis of them. In the findings section for each country I described my findings using continuous text and matrices. The continuous text included quotes from the interviews that were relevant and where needed, some additional explanation or ties to related research and data. Some of the quotes demonstrated a common theme that emerged from the interviews while other quotes exemplified the differences in responses. The matrices were used to summarize some main findings in my text by allowing for more detail to appear in the tables, which included various aspects of the results (Schreier, 2012, pp. 218-224). The inclusion of citations throughout the findings section is critical because they give clear examples of what the experts said and provide “meat” to the causal findings. They also make the findings much more pleasant to read (Gläser & Laudel, 2010, pp. 273-274). Many of the quotes from the expert interviews are accompanied by data from documents or secondary literature as a way to check some of the statements or to fill in missing information. The results from the two countries are compared in the final chapter.

Chapter 4: Historical Chapter

Overview

In this chapter I show the ways corporations have historically been involved in K-12 education in Germany and the U.S. from the late 1940s through the late 1990s.

Included here are important sequences of events and data that detail the way companies have been active in education through vocational education and corporate philanthropy and what may have influenced them.

Why an Historical Chapter

There are many scholars who have written about the history and development of vocational education in Germany (see for example: Baethge, 1983; Baethge, 2003; Busemeyer, 2009; Greinert, 1995; Taylor, 1981; Thelen, 2004) and the United States (see for example: Advisory Council on Vocational Education, 1974; Grubb & Lazerson, 2007; Hayward & Benson, 1993; Münch, 1989; Thelen, 2004). The development of the role of corporate philanthropy in K-12 education and how this role relates to other roles, such as the vocational education role of companies, however, remains unexplored. Understanding how and why corporate philanthropy became active in Science, Technology, Engineering, and Math (STEM) K-12 education in the U.S. and Germany requires an analysis of how companies have been active in education over time.

The lens of historical institutionalism allows for the analysis of how institutions shaped the ways actors behaved and defined their interests over time (Hall & Taylor, 1996, p. 938; Thelen & Steinmo, 1992, p. 2). Analyzing secondary literature about the role of business in K-12 education, I use path dependency theory to show how past education and philanthropic events have bound the education engagement options available for businesses. To do so, I analyze the *Reactive Sequences*, which are chains of events that are dependent on events that preceded them and can transform or even reverse the effects of earlier events (Mahoney, 2000, pp. 507-509).

The main questions addressed in this chapter are (1) how and why did corporate involvement in K-12 education changed overtime in Germany and the U.S., (2) what were the driving factors and actors behind these changes, and (3) how did these

changes effect the options for corporate philanthropy in K-12 education by the turn of the millennium.

Why the Late 1940s through 2000

Although the histories of both vocational education and corporate philanthropic involvement in education arguably go back hundreds of years, the analysis here starts in the late 1940s. From a German perspective, the first years after the war represented the chance for new beginnings, a new form of governance, and a completely different path than what the country had been on under the Nazi regime. In all sectors of governance including education, the years immediately following the war were full of opportunities for change, both imposed and voluntary.

Germany was under military occupation between 1945 and 1948. During this time, under the Potsdam agreement, the U.S. and its military forces took on the role of West German “reeducation” with the goal of ridding the education establishment of any ties to Nazi ideas while firmly establishing democratic ideas within the education system (Heidenheimer, 1974, p. 389; Meyer, 2011, pp. 200-204; Robinsohn & Kuhlmann, 1967, pp. 311-314). It was during this time that the U.S. formed a commission of American education experts to develop guidelines for changing West Germany’s (from here on- Germany²³) tripartite secondary education system; which the U.S. viewed as being too hierarchal and as a result, not conducive to forming a democracy. When the commission issued their report, better known as the Zook Report, named for the chairman of the commission, they recommended an American-style comprehensive school to replace the three paths of secondary education the German system offered. They specifically argued that vocational education should be a part of the comprehensive high school experience, not in separate schools or in the dual system. This new plan was outright rejected by many German education officials²⁴ and ultimately the U.S. admitted defeat in this area, allowing Germany to maintain its tripartite education system (Meyer, 2011). Given the view of the commission, one

23 Although I refer to it as Germany, through most of this chapter, it should be understood as West Germany. I have focused on West Germany because of its interactions with the American government regarding education policy and because throughout this analysis, it maintained its tradition of firm-based vocational training.

24 Because the responsibility for education is a state right, not a federal government right in Germany, there were several education officials involved in these policy discussions.

would not expect the U.S. to adopt the German system of secondary education but that perhaps one could expect the commission to recognize elements that could be beneficial to the U.S. This does not appear to have happened; which is why this is an ideal time period to start my analysis- both countries perceived the form of their public elementary and secondary education system as the right system for them at that time.

German employers also benefited during this time from the continuation of apprenticeship vocational education programs. Due to the high number of casualties of the war, employers needed many new skilled workers. The Allied Forces ultimately saw this as favorable because it addressed the issue of high youth unemployment which could have resulted political unrest among the German youth population (Thelen, 2004, pp. 240-241).

The late 1940s marked a “restart” for philanthropy in Germany. After the inflation years of the 1920s depleted most foundations of the wealth they had, the National Socialist years between 1933 and 1945 resulted in the further decimation of many foundations. By 1945 there were about 1,000 foundations left. This is a huge drop when one considers that in 1910 there were more than 20,000 foundations. Those that were left had minimal resources (Strachwitz, 2007, pp. 102-103). During this time philanthropic giving happened mostly through collection and giving campaigns through churches with a focus on refugees and those whose homes were bombed out during the war; as well as, church institutions such as nursing homes and early childhood care centers. The churches were institutions with long histories of collecting and distributing funds to the needy and many people in Postwar Germany trusted them as such (Lingelbach, 2006, p. 102). The founding of foundations did not play a large role in philanthropic giving (Adloff, 2010, p. 351). As for corporate philanthropy, new coalitions such as the Stifterverband der Deutschen Wissenschaft,²⁵ were formed with education as a top priority; however their focus was largely on rebuilding universities that were destroyed in the war as a way to also rebuild the research capacities that aided industry (Stifterverband für die Deutsche Wissenschaft, 2014; Strachwitz, 2007, p. 106).

25 There was a precursor organization called the Stifterverbandes der Notgemeinschaft der deutschen Wissenschaft but after WWII, there were many changes including the name.

From a U.S. perspective, the late 1940s were also significant on the philanthropic front, especially for corporate philanthropy in the field of education. Earlier the 20th century foundations involved in education concentrated on building educational institutions such as schools and universities and on influencing policy. The foundations of Carnegie, Rockefeller, Ford and many others for example funded and promoted the creation of education institutions such as schools for African-American students in the South, universities for the training of teachers, the Educational Testing Service (which ultimately created the SAT), standards for teacher training, state education agencies, and high school course requirements (Hammack & Anheier, 2013, pp. 75-77; Hess, 2005b, p. 2). By the end of WWII however, with the growth of government in the provision of public education, rising incomes, and declining economic inequality, foundations needed to redefine their roles. “Overall, foundations pursued limited purposes with limited resources” with many funding curricular initiatives, teacher quality programs, and reform campaigns but overall struggling to find a role for themselves now that the government had such an active role in education” (Hammack & Anheier, 2013, pp. 75-78, 100, 102, quote p. 194).

For corporate philanthropy however, it was a bit different. With the postwar prosperity that many corporations experienced and a public trust in companies because of their performance during the war, corporate philanthropy was encouraged to grow. The passing of new laws and court decisions that were favorable to the use of corporate funds for philanthropic purposes also fueled the growth of corporate philanthropy. Higher education was a top priority because of the recently passed G.I. Bill which helped millions of WWII veterans go to college, a need for more skilled workers, and the growing threat of the Soviet Union’s ideas and advancements in science and math (Sharfman, 1994, p. 254).

To wrap it up, I start my analysis with the late 1940s because both countries saw no need to significantly change their public K-12 education systems. In Germany’s case this meant maintaining the system of direct involvement by businesses in training students in specific career skills through dual vocational training. In the U.S., this meant maintaining a system of comprehensive high schools with limited options for vocational training and almost no involvement by businesses. I also start with this

time period because philanthropy in Germany was almost starting anew and foundations were unable to play much of a role in the philanthropic scene. In the U.S., foundations long revered for their institution-building abilities, were struggling to find appropriate roles for themselves in light of growing government social programs. Meanwhile corporations had earned much public respect and trust because of their wartime abilities and were facing an environment that encouraged corporate philanthropy to grow and they initially chose to focus on higher education. From education, corporate, and corporate philanthropic vantage points, the late 1940s is an ideal point to start my analysis.

The secondary analysis is divided into three phases, which each have characteristics unique to them. The late 1940s through the 1950s were the immediate postwar years for both countries. From an education perspective, in both countries, this was a time for “returning to normal” after the war years even though “normal” was challenged in both countries by the Cold War. Sputnik played a role in both countries regarding concerns about the competitiveness of their education systems. In the U.S., this time was also affected by the G.I. Bill, which paid for higher education for returning WWII veterans and would play a large role in the establishment of corporate philanthropic giving in the education field. Philanthropically in the U.S., these years could also be seen as the start of strategic philanthropy when foundations focused on making their grant-making more effective with an emphasis on leveraging their funds towards change (Lagemann & Forest, 2007, pp. 58-59). In Germany, philanthropy was basically starting from scratch but continued to grow through the end of this period (Strachwitz, 2007, pp. 102-103).

The 1960s and 1970s was a time of great attention to equal opportunities in education (and other rights) in both countries. This can be seen in the U.S. with the civil rights movement and the implementation of education policies following the Supreme Court’s decision in *Brown v. Board of Education* (1953) that deemed separate but equal education unconstitutional. In Germany with the many reform proposals and administration led by the social democrats, equal opportunities in education and flexibility in education tracks were a big theme during this time (Geißler, 2011, pp. 827-832). The governance of vocational education was also a major theme during this time and resulted in a new, more inclusive governance structure (see for example: Taylor, 1981, Chapter 9). The late 1960s and 1970s also represent the start of

“Movement Philanthropy” in the U.S., which prevails through today and is tied to the use of philanthropic funds towards conservative ideology (Himmelstein, 1997, pp. 25-28; Lagemann & Forest, 2007, pp. 61-62) It also played a big role in the further development and growth of corporate philanthropy, especially in the area of education. Germany also started to have some new foundations that saw themselves as playing an important role in the start of a “new social movement” (Strachwitz, 2007, pp. 119-121; 2009, p. 129).

Lastly, the 1980s through 2000 were selected as a time period because of the shift in both countries towards more conservative politics and policies, the enormous emphasis in the U.S. on education reform, and Germany’s reunification. With the election of Ronald Reagan (Republican) in 1980 in the U.S. and of Helmut Kohl (CDU) in 1982, both countries experienced a shift from the years of more liberal administrations of the 1970s to more conservative administrations with friendly ties to the business community. In the U.S., the release of the report *A Nation At Risk*; which linked educational issues to economic concerns, led to a movement towards standards and accountability in education and led to increased interest in education among business and philanthropic leaders (Mehta, 2013, pp. 103-104; Spring, 1997, pp. 397-399; Tyack & Cuban, 1995, pp. 33-34, 39). In Germany, the “Fall of the Wall” in 1989 is most significant for this research because of the many effects it had on its Germany’s collectively organized vocational system (see for example: Baethge, 2003, pp. 553-558; Busemeyer, 2009, pp. 127-139; Wagner, 1999). From a philanthropic standpoint, the 1990s were also a time of extreme growth in corporate foundations in both countries (Foundation Center, 2011, p. 7; Junck, 2007, p. 37).

I end this chapter with the late 1990s because there are many unanswered questions and limited research about the early 2000s. I theorize that the PISA Shock in Germany and the mass availability of data and the concern about the number of “failing schools” in the U.S. as a result of NCLB led corporations to change their roles in K-12 education. While there are plenty of scholars who have written about the effects of these events on education in the U.S. and Germany (see for example: Darling-Hammond, 2007; Hartong & Münch, 2012; Knodel, Martens, Olano, & Popp, 2010; Köller, 2009, 2011; Meier, 2004; Niemann, 2010; Ravitch, 2010) and the reactions of foundations, (see for example: Hartong, 2012; Hess, 2005b; Höhne, 2012;

Reckhow, 2013a) there is no research about how companies both from a vocational and philanthropic standpoint, changed their role in K-12 education after these events. In my chapter about the 2000s I continue with the same themes included in this chapter but with many open questions, which are addressed in my interviews of experts.

Late 1940s Through the 1950s

Corporate Involvement in Education in Germany

Immediately after the end of WWII the Allied Forces were busy with every aspect of restarting a West German administration and the German people were trying to survive after being defeated. For many Germans this meant finding food, shelter, and warmth in a country that had not only lost a war it started, was severely bombed and overall devastated but was also absorbing millions of German refugees from Eastern European countries. Regardless, the Germans worked to help restart and reform the education system in the three Western zones so that it could be up and running as soon as possible (Taylor, 1981, pp. 90-91).

The Germans were long proud of their education system. They had pride in the German concept of *Bildung*- that each person was to take part in a life-long process of human development and cultural learning, always reaching towards a better self (Meyer, 2011, p. 196). Added to that was the pride they had since the Prussian education system of the 19th century; a world-renowned education system. In 1945, there were many debates about the education system they were so proud of and the role it played in the Nazi movement. This was especially the case for the vocational schools (*Berufsschule*), which educated roughly 90% of German students in the later secondary years. Many scholars argued that during the Nazi years and some years prior, vocational training became overly specialized in industrial skill development at the cost of character and personality development. This resulted in specialists who understood only their trade and had little knowledge of the ethics of their trade or of higher human values (Greinert, 1999, pp. 84-85; Taylor, 1981, pp. 93-94).

All three Allied Forces countries also came to the same conclusion about the German education system and more specifically the vocational portion of it. Initially both the

American and British occupying forces failed to understand the immensity of vocational education and the role it played in German education. They viewed it through their own lenses of being of low-status and unimportant. Common across the three occupying forces was an emphasis on the need for the inclusion of instruction to promote democracy and civic responsibility (Taylor, 1981 Chapters 2,3,4). The Americans tried to force the Länder (U.S. Department of Education) under their control into the American comprehensive high school model where vocational options are included in the high school; they are not separate. The responses to these reforms from the state-level education secretaries (Kultusministers) ranged from procrastination to all out resistance. Despite the enormous changes in governance there were no major structural changes to the vocational system by 1949 when the Allied Forces turned the administration of education back to the Germans (Meyer, 2011, pp. 199-203; Taylor, 1981, pp. 58-65). Employers were against any of the proposed reforms that would have shifted towards a school-based model of vocational training because it would have left them without their much needed apprentices (Thelen, 2004, p. 245).

During this time the Allied Forces and the Germans also started to worry about the large youth population, which was even bigger than one would expect due to the Nazi reproduction policies. They became concerned that a disengaged and unemployed youth population could lead to new problems and radical ideologies, especially because most of them grew up surrounded by Nazi ideology. Added to this problem was the fact that the country needed to be rebuilt and many men of working age were either killed or injured in the war so skilled men were urgently needed (Greinert, 1999, p. 85; Taylor, 1981, p. 30; Thelen, 2004, pp. 244-245).

Ultimately the Allied forces came to understand the importance of vocational education in Germany and the role it could play in addressing the problems above. As a result and after much debate, vocational education was able to survive largely intact but would now include more courses and time aimed at supporting democracy and civic development (Taylor, 1981, p. 108; Thelen, 2004, pp. 240-242). They also worked with the German administration to open as many vocational schools as soon as they could. This was not a small feat given the extreme teacher shortage due to war casualties and the denazification process of the teaching ranks; which was even more

severe in vocational schools because the skills and technical knowledge of the teachers had been of great use to the Nazis. This was also a challenge because of the dearth of school buildings which had been bombed during the war; again, a situation that was even worse for vocational schools because they often housed materials and supplies that could be used for war activities (Taylor, 1981, pp. 56-57).

Throughout the reform processes of the Allied Forces and the German administration during the occupation, the focus was mainly on the school-based portion of vocational education, not the employer-based portion. In essence, the employer-based portion of the vocational training simply resurfaced right after the war (Taylor, 1981, p. 131). Many of the German businesses saw the opportunity to restart the dual vocational training programs as a way to help rebuild their reputations after their wartime activities. It also allowed them to be seen as working along with the new democratic structure and as an opposing force to communism (Baethge, 1970, pp. 60-63). For them, the apprenticeship programs also provided a source of much-needed cheap labor (Thelen, 2004, pp. 240, 243).

German employers were able to take the role of preparing apprentices because of their involvement in Chambers that represented commerce and industry and handicraft workers. Just after the end of the war and without any legal recognition of their authorities in the administration and oversight of plant-based dual vocational training, the Chambers opened an office for the National-level coordination of vocational training (Arbeitsstelle für Berufserziehung des Deutschen Industrie- und Handelstages and later, Arbeitsstelle für betriebliche Berufsausbildung- ABB). In this role, the ABB defined and updated occupational profiles for industry, developed training guidelines, provided materials regarding the training, monitored training, and oversaw the examination and certification processes of apprentices (Greinert, 1999, p. 86; Thelen, 2004, pp. 245-250).

In contrast to the years under the National Socialist regime where all of these functions were carried out by the state, now it was the Chambers in a self-governance style of regulation who wanted to keep the function of training out of the hands of the state (Baethge, 1970, pp. 64-65). This was viewed favorably by both the conservative German government headed by Chancellor Konrad Adenauer who believed in the

need for employers to take on the vocational training role and in less state involvement in vocational training. This also played well with the Allied Forces, especially the Americans who viewed the role of the employers and the chambers as a way of decentralizing the governance of vocational education, an approach they favored in many sectors after Germany's recent history of an overly nationalized government. This was also apparent in the new structure of education governance where the responsibility for public education resided at the state-level instead of the national level but allowed for coordination among the states through the Standing Conference of the Ministries of Culture (known in Germany as the Kultusministerkonferenz or KMK) (Thelen, 2004, pp. 246, 250). Asked by federal- and state-level authorities in 1949 to examine the vocational system and propose ways to improve it for the future, the KMK brought together a committee of actors active in vocational education including industry representatives, union members, and educational experts. Ultimately, aside from advocating for more time in vocational schools, they did not advocate for any major changes to the in-plant model of education (Taylor, 1981, pp. 141-148).

While it seems all actors agreed that in-plant training was beneficial, the unions questioned if it was right for private industry to be in charge of the education of so much of Germany's youth. They wanted to have more official recognition and a voice in the coordination of training. The firms argued however, that because they were paying for it and ultimately held responsible for the quality of the training, they should have the requisite regulatory powers (Thelen, 2004, pp. 246, 250, 252).

The German government in 1950 further supported the role of the firms as providers of vocational training by providing firms with low-interest loans to increase their dual training programs. The government was concerned with the high number of youth without training or jobs and the aging population of highly skilled workers, (Taylor, 1981, pp. 124-129). The official legal authority to administer and monitor vocational training was awarded to the handicraft chambers in 1953 (Greinert, 1999, p. 88) and to the commerce and industry chambers in 1956. Through this legislation, the vocational training responsibilities of the chambers were defined as "public" and therefore, subject to some state supervision. The chambers were also now required to have some employee representation (Thelen, 2004, pp. 256-258). During the 1950s,

as Germany became the lead exporting country in Europe and experienced the “economic miracle” (Wirtschaftswunder) due to a large increase in the demand for German goods, the role of employers in training students was further reinforced (Taylor, 1981, pp. 121-122).

As a result of the fast growth of the economy, there was concern about a shortage of skilled labor and a concern about the growing number of skilled workers in the Soviet Union. After the launch of Sputnik, there was alarm that the Gymnasium route to university as the only route to higher education would not provide enough workers with training in science. This led to the start of the *Berufsaufbauschulen* for selected vocational tracks or schools, which offered more general education and trade knowledge and opened additional opportunities to enter schools of engineering or commerce. This also led to an increase in public interest in education issues (Taylor, 1981, p. 161).

While the role of German firms in education through their involvement in vocational education was a strong and pronounced role, after 1945 they became active in areas of education in ways they had not been previously. Aside from their vocational role, industry also became involved in general education policy as well. They started to be active in education through participating in events such as teacher association conferences, education roundtables, and high-level political discussions about education. Some of the industry associations also created education offices or education-related positions, showing that involvement in education was seen as part of a long-run strategy. Martin Baethge (1970) points to many reasons for this interest in general education including the desire to maintain educational structures critical to the vocational training constellation and the structure of German society itself; both of which were beneficial to industry’s ability to retain power. In this way, industry can be seen as maintaining the *Herrschaft* (ruling class or group) over all aspects of education, not just vocational education (pp. 59-76).

Industry’s role in other education initiatives through corporate philanthropy or foundations; however was almost non-existent during this time. As mentioned earlier, by 1945 Germany’s foundation sector overall was decimated after the hyperinflation of the 1920s, the effects of the Nazi regime, and the loss of the war. From a

foundation sector that once had more than 20,000 foundations, there were now a little more than 1000 and they had limited resources (Strachwitz, 2007, pp. 102-103). Compared to other philanthropic endeavors such as churches, foundations played almost no role (Adloff, 2010, p. 351; Lingelbach, 2006, p. 102). As with education, each of the Allied Forces took a different approach to the development of foundations laws in the German states that they occupied. For businesses that were trying to restart operations while simultaneously dealing with a new governance administration and a tremendous loss of plant facilities and materials, it is not surprising that corporate philanthropy was not a major theme at the time. Despite this backdrop, there were some corporate foundations such as the Leibniz Foundation for Art and Science founded during this time (Strachwitz, 2007, pp. 103-104, 106-107).

Despite the drastic decline of foundations, the foundation sector in all three West-German zones started a new phase. A foundations working group in Bayern of 29 people started in September of 1948 to develop the general conditions and laws for foundations to be adopted by the West German states. They drew from previous German laws regarding the tax privileges and purposes of foundations and agreed that foundations must be aligned with the interest of the state and fulfill a public purpose. In 1949 Germany's constitution although it did not mention non-church foundations directly, clearly allowed for them to exist and drew upon many of the same laws the working group drew on (Adloff, 2010, p. 354; Strachwitz, 2007, pp. 99, 102-106; 2009, pp. 124-126).

Between 1950 and 1959 there were 288 foundations started. This figure is double the number founded in the previous decade; however, when one considers the tumultuous years of the 1940s in Germany, this is hardly surprising. The foundations founded during this time put an emphasis on education, research, and culture. Many were supported by industry to help rebuild the universities that were destroyed during the war (Strachwitz, 2007, pp. 106, 114).

One group in the effort to rebuild the universities was the Stifterverband für Deutsche Wissenschaft (Strachwitz, 2007, p. 106). Restarted in 1949, the group which had previously collected funds from the business community to support the government's science development initiatives was now known as the "Society for the

Promotion of Research and Teaching” (Stifterverband für die Deutsche Wissenschaft, 2014). In the 1950s as Germany’s economy started to grow with great speed “a tight interdependence between the development of foundations and the building up of the economy is obvious” (Strachwitz, 2007, p. 117). There were also about 70 corporate related foundations founded in the 1950s and 1960s that were active in mainly higher education. They gave away scholarships and supported some trainees that were closely associated to their industries in an effort to train people with the skills and knowledge the companies needed (Hanke, 1971, pp. 49-50).

The American influence on the development of the foundation sector could be strongly felt during the 1950s. Some large German employers for example were encouraged to start grant-making foundations. American foundations such as the Ford foundation who were active in Germany at the time and American philanthropic advisors encouraged the development of foundations. Examples include the development of the Fritz Thyssen Foundation and the Volkswagen Foundation (Strachwitz, 2007, pp. 114-117).

In sum, regardless of the enormous changes in governance following the end of WWII, the educational structure remained largely the same and the traditional role of the employer in the employer-based training persisted throughout the late 1940s and 1950s. In this role, the employers provided standardized vocational training in the workplace for students while also participating in associations that coordinated and monitored vocational training. As turbulent as the after-war years were and regardless of the actors involved, the employer-based portion of the training was not only able to survive but ultimately supported by all actors, including the Allied Forces and the unions. As Kathleen Thelen (2004) puts it “actors when faced with great turbulence and uncertainty, do not necessarily seize this as an opportunity for creative experimentation, but rather hold tight (to the extent possible) to familiar institutional forms and routines” (Thelen, 2004, p. 240). This was also the case for philanthropy in Germany where they retreated to laws and regulations that governed foundations before the end of the war.

In restarting vocational training there is no question; the businesses were acting in their own self-interest to acquire cheap labor and to start their companies as soon as

possible. However, the vocational training actions of the employers and their representative chambers were also considered the solution by the Allied Forces and the German administration to many potential problems such as high youth unemployment and disengagement, addressing the current and future skills shortages due to war casualties and injuries, decentralizing the governance of education, and rebuilding the country and the economy.

The opinion and the treatment of vocational training by the Allied Forces shifted from a view that it was an anti-democratic system of education that was largely responsible for the rise of the Nazi ideology to a view that the vocational training system could help to rebuild the economy and the country and ward off radicalization of the youth population. Jacob Hacker's work on the institution of welfare policy overtime in the U.S. shows how an institution can remain fairly intact but how a changing environment can alter the role it plays in society (Hacker, 2005), vocational training in Germany had a similar experience in the 1940s and 1950s.

Corporate philanthropic involvement in education during these years was barely existent. This was largely due to the huge task businesses had in rebuilding themselves and the minimal role foundations played during this time. That said, the building blocks for further foundation and philanthropic involvement were laid through the formation of a working group on foundations and through the reformation of organizations such as the Stifterverband für Deutsche Wissenschaft²⁶. When corporations were engaged in education philanthropically, it was at the higher education level. It appears employers played a larger role in the provision and administration of vocational education and little to no role through philanthropic endeavors in the K-12 sector. When thinking of this in corporate responsibility terms, this is a clear example of what Matten and Moon and refer to as implicit CSR whereby there were "values, norms, and rules that result in (mandatory and customary) requirements for corporations to address stakeholder issues and that define proper obligations of corporate actors in collective rather than individual terms" (Matten & Moon, 2008, p. 409).

²⁶ Note- this was not the name at the time.

Corporate Involvement in Education in the U.S.

In the late 1940s, after a major victory in World War II that resulted in becoming a superpower and having an education system that produced the highest percentage of people with a secondary education in the world (Grubb & Lazerson, 2007, pp. 45-46), there were few reasons for the U.S. to change its education ways. With the comprehensive high school model as the most prevalent model of secondary education, there were far fewer vocational schools or regional centers that offered solely a vocational track of education. Most students received minimal or no specialized vocational education and training during high school, relying instead on additional education at community colleges or technical schools or on-the-job training provided by employers. In this model, employers played little to no role in the provision of education training in secondary education.

The comprehensive high school of the 1940s was a mix of the vision of the common school as a place to instill common values and build citizens for the still-young United States and of the reformers of the early decades of the 1900s who thought schools should better cater to student abilities (Tyack & Cuban, 1995, pp. 16-18). In 1918, with a growing secondary school population and changing views about how best to accommodate all the new students, the National Education Association released its report, the Cardinal Principals of Secondary Education. This report laid out the vision of secondary schools that offered all education options necessary for both the academically and non-academically inclined students under one roof (Hess, 2010, pp. 110-111; Schneider, 2011, pp. 12-13). In the comprehensive model, vocational courses were available at the school with few if any interactions with business (Thelen, 2004, p. 195). Some well-known scholars, including John Dewey, argued that schools were for developing the whole self and the community, not a way to improve the economy. They feared that business involvement would segregate training for occupations at the expense of democratic values and general education and would stratify the social classes (Gordon, 1999, p. 26).

Most of the comprehensive schools; however, did not fulfill the goals of the common school experience. Instead, most of them had distinct tracts within their schools, one for those likely to go on to college, one for the students more likely to go straight to skilled work, and one for those who would go on to unskilled work. In this sense, the

American high schools themselves became vocationalized because the curricula were organized around the predicted future education and career opportunities of students based on differentiated learning models (Grubb & Lazerson, 2007, pp. 39-41). This was partially due to the federal government's Smith Hughes Act of 1917, which required states receiving money under the act to create a Board of Vocational Education to govern vocational education. Additionally, the act required that teachers paid out of the funds tied to the act could be vocational teachers only and that students involved in vocational programs could not take more than 50 percent of their other courses in non-vocational courses. This led to a separate vocational education system within the comprehensive schools. System may also be the wrong word as the governance of vocational education was highly decentralized often with local school boards or even the schools themselves making decisions regarding the requirements for vocational high school degrees (Hayward & Benson, 1993, pp. 5-7).

The vocational tracks of training were significantly less attractive than the academic tracks because they limited the opportunities for advancement. During the First World War and the years following, many industries struggled with the dilemma of having a shortage of skilled labor in the face of a high number of semi-skilled immigrants. To conquer this problem, many firms rationalized production so that workers would train in narrow, very specialized operations and would require minimal on-the-job training, while simultaneously recruiting highly educated white-collar workers to supervise them. This lack of a career ladder for workers with a vocational background resulted in a negative selection process where students who were weaker academically were placed in the vocational track. It also led to an overall bad stereotype for vocational training at the secondary level as a dumping ground. "This being the case, employers became less inclined to tap these schools for recruits, and less inclined generally to support the expansion and improvement of vocationally oriented public schooling" (Thelen, 2004, pp. 202-211, quote p. 211). Some scholars argue that the vocational option served as a stratifying mechanism with wealthier, more advantaged students going to academic tracks and all others including disadvantaged students ending up in either vocational education or the general track (which also had many occupational and vocational courses). Minority students were also over-represented in vocational courses and were in effect segregated by these courses into low-paying, low-status careers (Grubb & Lazerson, 2007, pp. 44-45; for a brief overview see: Oakes, 1983,

pp. 330-332). Segregation of students by race was becoming a major issue during this time because of the landmark case *Brown v. the Board of Education*; in which the Supreme Court ruled that schools could not be segregated by race. The language of this historic ruling also encouraged other groups to push for progress in educational access (Spring, 1997, pp. 360-365; Tyack & Cuban, 1995, p. 26).

While industry was not involved in vocational education directly, business leaders were often elected members of local school boards who placed an emphasis on efficiency. Immediately after the end of WWII and in the early 1950s the National Association of Manufacturers and the Chamber of Commerce joined several interest groups pushing for additional spending on education. They argued that additional funding was necessary because better education resulted in better incomes (Tyack, 1974, pp. 126-129, 274-275). As the federal government increased its involvement in social and educational issues after WWII, however, the role of business became less pronounced (Kanter, 1999, pp. 2-3).

While corporate involvement in K-12 public education was minimal during this time, corporate philanthropy was thriving. By the end of WWII, corporations were giving to philanthropic causes at record levels with their contributions having increased more than eight fold between 1936 and 1945 (Andrews, 1993 [1952], pp. 42-43). Prior to this, “philanthropic gestures were almost entirely based on individual wealth, not corporate wealth” (Kanter, 1999, p. 5). Businesses became more philanthropically active in education, mainly higher education, because of changes in federal and state laws between 1935 and 1952 that allowed them to receive tax breaks for giving to causes that business leaders determined were related to their businesses even if there were not direct benefits to their businesses (Himmelstein, 1997, p. 18).

During WWII, the corporations contributed to major donation campaigns, such as the Red Cross of Community Chests, with the prosperity of wartime production allowing them to contribute even more. The excess profits tax introduced in 1942 with up to a 90 percent tax on profits over a particular level also encouraged corporations to donate more to charitable causes as a way to decrease their tax bills (Andrews, 1993 [1952], pp. 42-43; Sharfman, 1994, p. 253). Corporate donations decreased by about 20 percent after the excess profits tax was repealed in 1945 but rebounded

significantly in 1947 and 1948 even though the tax incentive was significantly smaller than during the war years (Andrews, 1993 [1952], pp. 43-44). In 1950, the excess profits tax was reintroduced and with it, the realization that some businesses were avoiding these high tax rates by either reorganizing into foundations or handing over their assets to nonprofit entities. To address this, the Revenue Act of 1950 no longer permitted the tax exemption of income that was not “substantially related” to an organization’s tax-free activities. It also required all foundations to publically disclose more information about their income and investments on an annual basis, created a distinction between foundations and other nonprofits, and continued to prohibit the use of substantial funds towards lobbying (Andrews, 1993 [1952], pp. 247-255; Hammack & Anheier, 2013, p. 80).

The new government role in education and social welfare programs and the distrust among some Americans in large corporations because of their hand in the Great Depression, led to a change in the way corporate philanthropy operated. The role changed from giving to major national funding campaigns to giving to a variety of causes of their choice through various mechanisms (Himmelstein, 1997, p. 19). Higher education fit perfectly in this new role. As the federal G.I. Bill provided funds for millions of U.S. veterans of WWII to go to college; which strained many higher education institutions, the corporate community saw a way to become involved and to help polish their image. They came together to bolster private universities, many of which were struggling financially as they took on so many new students because of a decrease in the private funds they were receiving (Himmelstein, 1997, p. 19; Sharfman, 1994, p. 254). They saw supporting higher education as a way of “furthering their own goals of obtaining highly skilled workers and maintaining the positive image that they developed during the war” (Sharfman, 1994, p. 254) They also saw supporting private institutions as a way of keeping government from becoming too big and running almost all of the higher education institutions (Himmelstein, 1997, pp. 19-20).

Up until this point, because of traditions and legal restraints, businesses could only give to causes that were directly related to their firms (especially if they wanted a tax deduction). As a result, when corporations gave to higher education, it was usually towards scholarship programs that were of direct benefit. When the leaders of several

well-known corporations came together to support higher education more broadly however, stockholders ultimately sued one of the companies. The judge in the case, *A.P. Smith Manufacturing Company v. Barlow*, ruled in a way that allowed all corporate support of higher education (Himmelstein, 1997, p. 21; Sharfman, 1994, p. 255). In 1953, the U.S. Supreme Court backed this decision by allowing the lower court decision to stand and further legitimized corporate philanthropy. “In retrospect the ultimate effect of this ruling was to declare dead, the doctrine of *ultra vires*²⁷ (concerning corporate philanthropy)” (Sharfman, 1994, p. 255).

After this ruling, there were several other court cases that expanded the use of corporate philanthropy towards many other causes and types of nonprofit organizations. Even though the requirement that the donation be related to the work of the firm was never officially thrown out, if it did not have immediate business rewards, it was now considered a matter of long-term business judgment, giving the businesses the freedom to decide (Himmelstein, 1997, p. 250; Kanter, 1999, p. 5; Sharfman, 1994). As businesses diversified their corporate philanthropy, some of the largest also started to professionalize their giving and created a cadre of corporate leaders who sought to create a culture of corporate giving (Himmelstein, 1997, pp. 22-23).

After the war the role of private foundations (non-corporate) became quite limited because of the growth in major government programs through the New Deal and other initiatives (Hammack & Anheier, 2013, p. 75; Himmelstein, 1997, p. 19).

Foundations such as Carnegie, Ford, and Rockefeller, which had spent earlier decades creating educational institutions and advocating for school access for poor and minority students, were now facing an educational system that served all students.

Many of the reforms and processes, such as teacher education training and the structure of schools, which they championed, were now highly institutionalized. The foundations felt now that their role was not as influential but they continued to work towards the improvement of the elementary and secondary education sector. The Ford Foundation for example, funded the development of the Advanced Placement courses, which offered students college credit for college-level courses taught in high school.

27 Refers to being outside the powers of the corporation and therefore previously not allowed.

Several of the large foundations also funded initiatives aimed at improving the teacher workforce but with limited effects. (Hammack & Anheier, 2013, pp. 97-98).

The Carnegie Foundation funded a study of America's high schools by former Harvard University President James Conant; which advocated for the enlargement of high schools so that they could provide different educational experiences based on the needs and abilities of students. This coincided with the national concern about the scientific and technical abilities of the U.S. and a new focus on educational "excellence" in K-12 education in the early postwar years and the deepening of the Cold War. The founding of the National Science Foundation in 1950 (despite the name, NSF is a federal agency), the Soviet launching of Sputnik in 1957, and the National Defense Act of 1958 ushered in an era of efforts aimed at improving the academic achievement, especially in science for high school students most likely to become future leaders. (Cheek & Quiriconi, 2011, pp. 119-120; Schneider, 2011, pp. 14-15; Spring, 1997, pp. 338-350; Tyack & Cuban, 1995, pp. 52-53). The focus was on improving academic education of those perceived to have talent and likely to go to university, not for students in vocational education programs.

Important to note here is that with the exception of General Electric and Westinghouse, which sponsored professional development summer institutes for high school science teachers between 1945 and 1949 (Cheek & Quiriconi, 2011, pp. 101-102), there is no mention of corporate philanthropy's involvement in K-12 education during the late 1940s and early 1950s. This is not to say that corporate philanthropy was not at all involved in K-12 education at the time but that their involvement was likely minimal in comparison to the big foundations of the time and they likely did not actively work with the big foundations to support similar causes.

In sum, businesses were barely involved in elementary and secondary education in the late 1940s and 1950s in the United States. In major industries production was structured so that workers required minimal levels of skill and were managed by highly educated white-collar supervisors. This did not lend itself well to a highly trained vocational workforce. The comprehensive high school model that dominated the American secondary education scene offered "one-stop shopping" for all education levels; however, students were tracked within these schools with those

perceived to be strong students in college-preparatory courses and those perceived as weak in vocational courses. This was further institutionalized by the Smith-Hughes Act, which specified various factors of vocational education as separate from the other courses. Students who wanted to work in management were discouraged from taking the vocational route as it often limited their future options. Businesses were not eager to work with the vocational programs because of their reputation as being a place for low-achieving students. During this same time period, changes in laws regarding corporate philanthropy and the involvement of several corporations in the preservation of private higher education institutions played critical roles in the options available to businesses later in K-12 education.

Comparison of the late 1940s and 1950s in Germany and the U.S.

In Germany, during the tumultuous years following World War II through the end of the prosperous 1950s, the firm's role as a provider of vocational training did not undergo major changes. With the exception of the addition of courses to further promote democracy and civics, the structure of dual vocational training did not change. What did change was the way influential actors, such as the Allied Forces, viewed the role of vocational education. Initially seeing the structure of dual vocational training as a leading reason behind Germany's fall into Nazi ideology, they came to see it as necessary to inhibit a large unemployed youth population from becoming radicalized by another ideology and as a way to rebuild the country. By taking on the role of vocational training providers and by joining chambers to administer and regulate vocational training, businesses were also able to improve their reputation after their wartime activities. The German administration under Konrad Adenauer further supported the role of business in training. In times of "educational struggle," such as the time immediately following Sputnik, vocational education and ways to improve its outcomes were perceived as key strategies.

In the U.S., which had just been elevated to a superpower because of its military and political prowess during WWII, there was both contentment and concern with American education. Overall, there was a feeling that the comprehensive high school model with educational opportunities for students of all levels of perceived cognitive ability, including vocational education was the best way to accommodate America's

growing and diverse high school population. At the same time, there were concerns about the academic competitiveness of the “brightest” American students. Vocational education had long been seen as a place to put students deemed as less intelligent. The excellence initiatives following the launch of Sputnik, further ingrained this view as it focused mainly on the most talented students. As a result of the low status of vocational education there was little-to-no involvement of the business community. The low-status also had the unfortunate side effect that minority students were often placed in vocational education. In both the German and the U.S. cases, the role of the firm (or lack thereof) in vocational training was further institutionalized during the late 1940s through the 1950s.

Corporate philanthropy did not have much involvement in K-12 education during these years but was involved in higher education in both countries. In Germany, after the foundation sector was nearly destroyed, new laws and regulations regarding foundations were drafted based on foundation laws from earlier times. Corporations came together to fund the rebuilding of higher education institutions through what would become the Stifterverband für die Deutsche Wissenschaft. Similarly, in the U.S., new laws regarding corporate philanthropy led to several business leaders coming together to save private higher education institutions; which were under financial stress. Key to both German and American business leaders was the need for higher education institutions to provide workers with the skills they needed to remain competitive. Although in the U.S., there was another layer- the fear among business leaders of all higher education institutions being run by the state. During these years in the U.S., philanthropy and also specifically, corporate philanthropy became the subject of several new federal and state laws and court decisions. The court decisions paved the way for corporations to give to causes that were not directly related to their area of business; which enabled them to give to many causes including education more broadly. The new laws set restrictions and reporting rules for foundations and defined the difference between a foundation and other “public charities.” The new laws and regulations of philanthropy is as we’ll see in later sections part of a pattern of ongoing involvement of the federal government in the foundation sector that is not nearly as evident in Germany. This would make a big difference in the years to come with respect to the role and form of foundations.

1960s Through the 1970s

Corporate Involvement in Education in Germany

Interest in vocational education among the political parties and general public grew in the early 1960s. According to M.E. Taylor (1981), there are three reasons for this growth: (1) Germany's living standards increased dramatically since the end of the war and now they could focus on other areas of interest, (2) Germans were more aware of the importance and outcomes of education and each political party wanted to show that they had a plan for education, and (3) since the start of the "second industrial revolution"²⁸ in the late 1950s, there was increasingly a belief that education and vocational education specifically required reform and federal involvement (p. 175).

In the early 1960s, the SPD (Sozialdemokratische Partei Deutschlands), Germany's center-left party proposed major reforms to the structure of the German educational system. This included creating comprehensive schools, which would extend elementary school to include the sixth grade, create common middle schools for all students from grades seven through ten and then continue to either vocational school or Gymnasium. The number of vocational programs under this proposal would be significantly reduced to promote mobility within industry. They also proposed that there be a federal level advisory committee and more coordination between the German states. "In emphasizing that trade and training was a public task involving the state, employers, and employees and in supporting the unions in their demand for a vocational education law the SPD clearly aimed at reducing the power and influence of industry in the task of preparing the nation's youth for work" (Taylor, 1981, pp. 175-180. quote p. 176).

Meanwhile by the mid-1960s, the CDU/CSU (Christlich Demokratische Union/Christlich-Soziale Union), the center-right parties, became more interested in education policy and also pushed for some level of federal coordination and coordination among states but otherwise, did not push for major structural changes. Instead they argued that industry and the individual should have maximum freedom with limited intervention from the state to pursue vocational training. The CDU/CSU

²⁸ Refers to the quickly increasing mechanization and automation in industry at the time.

and employers further emphasized the provision of business by pointing out that industry was spending about 2.5 million Deutsche Marks each year on training and also provided about 80,000 volunteers to make the system work. The FDP (Freie Demokratische Partei), Germany's more libertarian party at the time also supported the existing system of vocational training. Like CDU/CSU, it also supported the freedom of industry and the individual and limited government involvement (Taylor, 1981, pp. 175-180, 184; Thelen, 2004, pp. 259-260).

The Trade Union Confederation (Deutsche Gewerkschaftsbund- DGB) was also pushing for reforms in the 1960s. Included in their proposals were plans to unify the scattered laws and regulations of vocational training into one law, to standardize training, and to ensure that unions had codetermination rights in the administration of dual vocational training. Vocational education teachers were also demanding to be more involved in the training administration process and for more required courses at vocational schools. Employers argued that the union proposals would result in additional and unnecessary bureaucracy, limit flexibility in training, and ultimately hurt the training programs provided by business (Taylor, 1981, pp. 183-184, 190-191).

Business associations specifically supported the three-track system (Haupt- and Realschule and Gymnasium) because they saw it as a way to insure the survival of the dual vocational training system and ultimately their power within the German governance structure. For the Hauptschule, they advocated for better facilities, more technology, and more effective teachers and reduced instructional time (to end at grade 9 instead of 10) because this is where the majority of the apprentices came from. For Realschule, which were considered the perfect mix of practice and theory by the business associations, they advocated for more of them, more flexibility to move between Realschule and other training possibilities including higher education, for the improvement of Realschule teaching and facilities, and for efforts to make Realschule more attractive. The rationale being that they wanted to encourage talented students to consider Realschule instead of Gymnasium and to maintain distinct differences between the Realschule and the Hauptschule. The desire to attract talented students also explains why they supported the *Zweiter Bildungsweg* (2nd education path to an *Abitur*/entrance qualification to higher education). For the Gymnasium and those who graduated with *Abitur*, there was little to no interest among the business associations.

Much of this was because there were very few career paths that were tied directly to the *Abitur*. They advocated against reforms aimed at increasing the number of students attending the Gymnasium to obtain their *Abitur* because they would drive up the costs of education, decrease the quality of education of the *Abituren*, result in too many graduates seeking academic credentials that the market did not demand, and compete for potential Real- and Hauptschule students. Basically, the business associations supported all school forms as they were and were against the concept of creating a comprehensive school form largely because of the perceived negative effects it would have on the dual vocational training system (Baethge, 1970, pp. 135-155, 161-162).

The political environment of the early 1960s was not favorable to reforming vocational education and the need to prepare for the elections of 1965 tabled the formal discussions and deliberations for a vocational education act. However, after the 1965 elections when SPD entered into a grand coalition with CDU/CSU, there was much more political appetite for change. The public was also more interested in education reform by this time because of scathing articles in Stern magazine about the state of vocational education and there was a growing focus on creating more paths to higher education and on improving the general education level and skills of all students. (Greinert, 1994, pp. 70-72; Taylor, 1981, pp. 185, 188, 195; Thelen, 2004, pp. 259-260). Some of this interest and the related policy proposals were also related to an extremely influential set of articles, which were later released as a book by Georg Picht called *Die deutsche Bildungskatastrophe* (the German Education Catastrophe). He argued that Germany did not have enough young people who were highly skilled or had academic credentials for the needs of the economy but that this situation was also unjust because many young people could not advance socially because they could not attain higher levels of education. In a famous quote, he stated that an education emergency is an economic emergency²⁹ and that the economic success of Germany would come to an end if the country did not increase the number of young people who were highly trained (Picht, 1964, (NOTE:quote p. 17)).

The focus on increasing access to higher education stemmed from the huge

29 In German: "Bildungsnotstand heißt wirtschaftlicher Notstand."

inequalities of access to *Gymnasium* (and therefore higher education afterwards) for students based on the education background and occupational status of their parents. As an example, in 1960 a student whose working-class father had attended the lower form of high school or had not finished had a 20 times lower chance of attending a *Gymnasium* as a student whose father had an executive-level position or an official government job. There were similar statistics for students who were considered ready for university (Geißler, 2011, p. 824). The higher education focus was also the result of a postwar economy that was shifting more towards the market-economy of the industrial sector and away from the traditional craft trades and small businesses. With this shift came awareness among the public of the changing education needs and the inequalities to access in education. This was especially the case because of Germany's strict division between general and vocational education and on the misalignment of vocational education offerings within the new economy (Greinert, 1994, pp. 70-72).

After much debate and compromise came the Vocational Training Act of 1969. The four main components of the law addressed “the initial training relationship of apprentices; the organisation of training at the place of work; the federal Länder, and local committees to control and administer training; and the establishment of a federal vocational training research institute.” The new Federal Vocational Training Research Institute (Bundesinstitut für Berufsbildungsforschung, BBF), which had equal numbers of employer and employee representatives and also state (Länder) representatives, vocational education specialists, and one representative from the BBF, was now tasked with defining the principles, the aims and methods, and the future directions of training. As a result of this law, there would now be comprehensive *national* regulations that governed the responsibilities of the apprentice and the employer and clearly defined standards and schedules for each type of training; thereby taking this function away from the chambers and giving it to the BBF. There would also be committees with employee and employer representation to advise the state level governments on vocational training. The chambers were also required to have committees with employer and employee representatives, as well as, vocational teachers (although they did not have any voting powers). These committees were able to decide on all regulations related to the corresponding area of training but there was a big loophole for industry. If the adopted regulations would cost more money, industry could veto them because they were essentially the ones paying for the

training. This as well as the fact that the chambers (effectively industry) were tasked with creating committees to control and administer work-place training, further cemented industries hold on vocational training (Taylor, 1981, pp. 209-216, quote p. 209-210; Thelen, 2004, pp. 259-261).

As much as the 1969 Vocational Act created more unified, standardized, and national guidelines for training, defined the legal framework for vocational training, and provided unions representation in the regulation of vocational training, it did not significantly change the “day-to day regulation and monitoring of firm-based training.” Basically, it also confirmed the role of employers in vocational training while simultaneously requiring some employee representation (Busemeyer, 2009, p. 79; Taylor, 1981, pp. 211-212; Thelen, 2004, pp. 262-263, quote 263). The law, which defined many facets for the first time in a legal context also delineated the role of the federal, state, and local-level governments (Greinert, 1994, pp. 68-69).

The desires and demands to reform vocational education did not stop with the passing of the new legislation; instead, the 1970s were full of additional reform proposals. Willy Brandt (SPD) took office as Chancellor of Germany in 1969 in a coalition with FDP, and came with the goal of providing equal opportunities in education, especially for the pupils of the working class. This put the CDU in the position of an opposition party for the first time. A main theme was the integration of general and vocational education, which was also suggested by other prominent researchers and advisory boards at the time. To do so, they put forwards proposals that suggested relaxing the rigid walls of the three tracks of schooling in Germany, including the full integration of vocational schools into comprehensive schools; thereby handing the state more control over vocational training. The unions welcomed these proposals because they continued to believe that business should not have so much control over an educational process. The business community was strongly against these types of reforms because they saw them as a threat to their self-governance of training and worried it would become an ineffective but costly state institution. The business community also threatened that if such proposals were passed, they would boycott their training programs all together. Meanwhile, in defense of the business community, the CDU/CSU argued that the economic crisis was no time to play with the education system. The combination of the economic situation and the business opposition put

reform talks aside until the mid 1970s when a new administration was in office (Busemeyer, 2009, pp. 80-88; Thelen, 2004, pp. 264-265).

The business community also did not agree with many of the proposed education reforms that did not deal with vocational education. The reforms aimed at equal opportunities in education included the SPD proposal to create comprehensive middle schools that would serve all students between 7th and 10th grades. This proposal and the proposals of several committees on education reform all advocated some form of organizational change to the tripartite system to ensure pupils would have more opportunities to prove their readiness for higher levels of education. However, the constituencies of the *Gymnasium* and *Realschule* including the teachers, their unions, parents, and the industry and trade associations, argued for the continuation of their own form of school. Industry organizations specifically argued against any increase in mandatory full-time schooling and highly supported and pushed for the further development of the *Realschule*. While these groups acknowledged the need for curricular reforms in science and some other subjects, they did not want to see them addressed through a restructuring of the school system. The CDU largely maintained its support for the tripartite system as it was (Robinsohn & Kuhlmann, 1967, pp. 319-324). Some of this support for the system as it was can be explained by Germany's heavy economic reliance on its high-skilled, export-dominated production sector and the strong attachment that many parents had to the three-tiered school system that prepared them for their careers (Baethge, 2006, pp. 22-24).

Aside from some pilot project schools that tried out a middle-school level³⁰ or some states that introduced the *Gesamtschule*³¹ (comprehensive secondary school), the tripartite structure remained relatively the same. What changed overtime however, was the distribution of students who attended the different schools with an ever decreasing percentage attending the *Hauptschule* and an increasing percent attending the *Gymnasium* (Nikolai & West, 2013, pp. 61-63 see more on this in next subsection- Germany in 1980s and 1990s).

With the switch from Willy Brandt to Helmut Schmidt (both SPD) and the governing

30 Hessen is an example of one that tried the middle school (see: Robinsohn & Kuhlmann, 1967)

31 To put the *Gesamtschule* in perspective: In 2009, just 9 percent of students attended one.

partner, the FDP (libertarian party) the education emphasis changed from reforming or integrating vocational education to creating more of it. In light of the new governance changes and the high youth unemployment, a new law³² was passed in 1976 that required businesses to offer 12.5 percent more training placements (Ausbildungsplatz) than the number of trainees applying for these placements or face a fine. Businesses did not want to pay a fine nor did they want to be told by the government how many trainees they needed to take on. To tackle these issues, employers, through coordination with their chambers, voluntarily increased the number of training placements by roughly 60 percent. They also legally challenged the constitutionality of the 1976 law. Germany's highest court (das Bundesverfassungsgericht) agreed with industry's interpretation and ruled it as unconstitutional in 1980 (Busemeyer, 2009, pp. 88-94; see also: Greinert, 1994, p. 72; Thelen, 2004, pp. 265-266).

While the discussions and policies regarding vocational training shifted towards creating more apprenticeship training opportunities during the 1970s, the idea of state-run vocational programs did not completely fall to the wayside. One of the many proposals of the 1970s related to more state-run vocational education was one for the incorporation of a foundational vocational education year (Berufsgrundbildungsjahr- BGJ). As originally proposed, this would take place as a full-time program for one school-year at state-run vocational schools and be required for all students continuing on the vocational track (Busemeyer, 2009, p. 101).

As in other proposed reforms of this type, the unions saw this proposal as a positive development because of the social mobility it could theoretically offer students and because it could be used as a buffer for the regional and sector specific training placement fluctuations (Greinert, 1994, p. 75), and because it was seen as a way to chip away at the industry's hold on vocational training. The employers meanwhile were split on the initiative with the larger businesses opposing it because they argued it would not provide the apprentices with the skills they really needed. The handworker associations were for it because then they would no longer be bound to keep apprentices after the first and most expensive year of training, as this would all

32 Name of law: Ausbildungsplatzförderungsgesetz (APIFG)

be done by the state. The federal administration soon gave the states the option to offer both a school- or business cooperative-based model of first year training. The majority of states supported the development of the cooperative model because it did not cost as much and the businesses were happy with this because it left the control of content mainly in their hands, and ultimately the unions were content because they could represent the apprentices from day one of their training (Busemeyer, 2009, pp. 102-104).

The preference for initial year training in companies led to the school-based year of foundational vocational education (BGJ) being seen as for students who could not get an dual training placement. The BGJ came to be seen as an option for those who were academically too weak and marked the start of the German “transition system” (Übergangssystem). This also coincided with the development of federal special education and work policies in Germany. Starting in the late 1970s, the federal government developed regulations regarding specific job categories for people with special needs; as well as, strict training regulations for each and would ultimately become a large portion of the state-run vocational programs. The unions welcomed this development because they argued that the local level decisions by chambers on the training of special needs individuals led to abuses by businesses. The business community countered the unions did not allow them to provide special needs trainees with the appropriate training (Busemeyer, 2009, pp. 104-105).

As for corporate philanthropic involvement in public K-12 education during the 1960s and 1970s in Germany, there is no research documenting how they were involved specifically at the time. Instead I proceed here with the continuing development of philanthropy and more specifically, corporate philanthropy during this time period along with some key influencing events and actors that had long-lasting impacts on the field of philanthropy.

During the 1960s the number of newly formed foundations in Germany continued to grow with an increase of 54.6 percent in the number of foundations founded over the previous decade. There was an even larger increase of 78.9 percent for 1970-1979 compared to the 1960s (Strachwitz, 2007, p. 121). Traditionally foundations in Germany played more of a corporatist role, operating as providers of services that are

funded largely by the state (Adloff, Schwertmann, Sprengel, & Strachwitz, 2006, pp. 172-179; Anheier & Daly, 2006b, pp. 17-20). Because of the strong presence of the state, many of the foundations founded in the 1950s and 1960s saw their role as complementary to the state and were embedded in the system of corporatism. Starting in the mid 1960s however, with some advising from American foundation experts, new foundations with visions of a “new social movement” were started (Strachwitz, 2007, pp. 119-121; 2009, p. 129).

With the founding of the Robert-Bosch-Stiftung in 1964 in the form of a corporation came a new type of foundation that desired to keep a distance from government initiatives and did not accept government funding towards its projects. Similarly, in 1977 the Bertelsmann foundation was founded by Reinhard Mohn as an operating foundation with the goal of solving social problems through projects that served as alternatives to the state’s initiatives. Both of these foundations and many others in Germany were founded by the leaders of family-run businesses (or through their trustee in the case of Bosch) who decided to form a foundation with the majority shares of the business; thereby making the foundation the majority holder of the business itself. This will be further discussed below but this practice was outlawed in the U.S. in 1969 (Strachwitz, 2007, pp. 117-121; 2009, pp. 129-131). The Robert-Bosch-Foundation, which is today one of Germany’s largest foundations, had only modest projects in education in the 1970s and early 1980s due to its commitment to a hospital and other financial issues involved in the creation of the foundation itself (Theiner, 2014, pp. 164,166).

Other major foundations with close ties to major businesses including the Körber Stiftung (1959) or the Alfried-Krupp-von-Bohlen-und-Halbach-Stiftung were also formed around this time period and some focused on education (Junck, 2007, p. 13; Strachwitz, 2007, pp. 117-119); however, they were founded by business owners themselves or their heirs and aside from being founded by someone related to the leadership of the business and using the wealth generated from the business to start the foundation, the foundations are not strongly tied to the business.³³ This type of

33 See: Junck, 2007 for list of definitions of various types of corporate foundations in Germany. For this topic specifically, see the difference between Unternehmerstiftung and Unternehmensstiftung on page 13.

foundation was the dominant type of corporate foundation founded in Germany through the 1980s. They are different than foundations that own majority shares of a corporation or those that were created or receive ongoing funds from the capital of a corporation³⁴ (Junck, 2007, pp. 9-15) and thereby have continuing financial and other ties to the corporation.

As stated above, there is no relevant research about the role of corporate foundations or philanthropy in public education during this time period. That is not to say that they did play a role, rather that it was either a minimal role or simply not written about. This is especially the case when one thinks of the German Mittelstand- the small and medium-sized companies³⁵ that make up a major share of the German economy. Many of them may have given to local education initiatives during this time but there is no research available.

To summarize German corporate involvement in public education in the 1960s and 1970s was not significantly different than it was in the two decades that preceded it. Most involvement in public K-12 education was through the provision of vocational training or through more of an implicit form of CSR; however, there is also evidence of the inroads to more explicit CSR through the creation of new corporate foundations. (for more on implicit and explicit CSR see: Matten & Moon, 2008, p. 409). Although new laws were passed that took away some of the responsibilities of the companies in favor of a more standardized, national system that also included some union representation, the day-to-day training did not look very different. Yet new state-run vocational schools were created, initially to offer the first foundational year of practical vocational education as a way to ensure students would receive a broader skill set. The option for firms to provide this first year of training themselves and an increase in the number of students with special needs in the state-run training schools led to the belief that the state-run schools were for those who were academically weak and could not get a firm-based vocational placement. This left many students leaving

34 Foundations founded with the capital from a corporation became more popular starting in the 1990s.

35 German Mittelstand “refer to small and medium-sized enterprises (SMEs), either according to the German definition (up to 500 employees and up to €50m annual turnover) or according to the European definition (up to 250 employees or up to €50m annual turnover).” For more on this, see BMWi (2013, p. 2 for quote)

the state-run schools with minimal recognized qualifications for getting a job and higher rates of unemployment. This is an example of what Streeck and Thelen (2005) refer to as a displacement process where a subordinate institution starts to have inroads through the active cultivation of a new logic inside an institution (Streeck & Thelen, 2005, pp. 19-27). In this case the state-run vocational training programs were the new institution and the new logic was that they were there to provide academically weak students with training instead of the employers that usually did so.

Even though the SPD-led administrations of the 1970s pushed for more comprehensive high school types of approaches and less employer involvement, due to economic circumstances, including high youth unemployment, they actually created laws increasing the role of employers in vocational training. In this way, the firm-based training continued to be an example of what Jacob Hacker refers to as institutional drift: the institution itself did not really change but the political environment around it did (Hacker, 2005). As Kathleen Ann Thelen (2004) points out regarding the 1970s- “what is significant is that the control issues and conflicts over chamber-based administration and supervision that had dominated previous debates were now completely eclipsed” (p. 265).

On the foundation and philanthropic side, although there was not evidence of much corporate investment or involvement in education, there was growth in the number of foundations with corporate ties. There were also the beginnings of foundations that saw for themselves a new role— not as a complimentary role to the state but as offering alternatives to state initiatives.

Corporate Involvement in Education in the U.S.

As in Germany, there was a large focus on equal opportunities in education in the 1960s in the United States. The *Brown* case is often seen as the start of the civil rights movement. By the early 1960s the movement was much more robust and resulted in the implementation of *Brown* through desegregation cases and integration processes; as well as, federal legislation. The civil rights movement encouraged other groups such as women or Mexican-Americans to also fight for their rights to equal educational opportunities and led to many new court decisions and laws granting

them these rights. Special education was also a major educational issue. Up until this time, many handicapped and mentally challenged pupils had been excluded from the schools because they were considered un-trainable (Spring, 1997, pp. 360-374; Tyack & Cuban, 1995, p. 53). At the same time, vocational education was criticized for its inability to meet the needs of these underrepresented students (Grubb & Lazerson, 2007, p. 42).

Congress passed the Vocational Education Act of 1963,³⁶ which still supported a separate system of vocational education but also broadened the scope by including additional occupational courses in comprehensive high schools and vocational programs for disadvantaged and special student populations. The Vocational Education Amendments of 1968 further emphasized vocational education in traditional comprehensive high schools and the need for vocational education to better serve students with special needs. It also broadened the definition of vocational education to be more aligned with general education (Advisory Council on Vocational Education, 1974). As with general education laws during this time, there were also provisions to include more women and other underserved groups such as bilingual students and Native Americans in vocational education programs through additional acts in the 1970s (Gordon, 1999, pp. 71-74). The inclusion of more students with special needs, reaffirmed vocational education as a track for students who were not fit academically. As Grubb and Lazerson (2009) argue, it was a track that prepared students for entry-level jobs of an earlier time period (p. 42), thus not making vocational education attractive to ambitious students or ripe for employer participation. Although cooperative work-study programs were encouraged during this time, very limited funding was set aside for this purpose and they were not wide spread (Gordon, 1999, p. 74).

Starting with the Kennedy administration and continuing through the Johnson administration came a focus on reducing the poverty rate through the so-called *War on Poverty*. Key to this effort was improving educational outcomes of poor students because of the belief that a good education for a child is the greatest defense against being poor as an adult. The Congressional responses to poverty were the passing of

36 Also known as the Perkins-Morse Bill

two acts- the Economic Opportunity Act (EOA) of 1964 and the Elementary and Secondary Education Act (ESEA) of 1965. In the EOA, the Job Corps was established by providing unemployed youth with work training and work-study while working on a government project. ESEA meanwhile, especially the section Title I³⁷, provided additional funding for school programs serving students determined to be “educationally deprived” (Spring, 1997, pp. 350-355). It is important to note here that although the need for job training for unemployed youth was addressed as an issue, industry was not seen as a main employer, rather the government was seen as the employer and the on-the-job trainer.

The late 1960s and early 1970s saw some direct involvement of businesses in public schools in the provision of education. With the focus on equality in education some policymakers turned to business to improve the performance of low-achieving students. With the Vietnam War winding down and an increase in spending in education by the federal government, defense contractors were employed through results-based contracts to improve the basic skills of struggling students through the use technology and the scientific management of learning as a potential avenue for profit. Most of the contracts stipulated that in order to receive payment, the contractors needed to prove at least a years gain in learning on standardized tests. The federal government subsidized many of these contracts and increased the number of programs funded in 1970. Concerns about these results-based contracts arose when a cheating scandal involving the end-of-the-year tests of one of the major contractors surfaced. This was followed by research results that showed no significant difference for the students in these programs compared to students in the traditional programs. This led the federal government to discontinue its funding of these programs and ultimately to their demise (Tyack & Cuban, 1995, pp. 117-120).

Private foundation involvement in public education during the 1960s and 1970s was minimal compared to their earlier institutional building years. The larger foundations such as Carnegie, Ford, and Rockefeller attempted to improve the teacher workforce but could not get over some of the bureaucratic hurdles in state departments of

37 Other sections of this law provided funding for many purposes including school libraries and books, local centers to promote education innovations, education research and the establishment of research centers, and the strengthening of state departments of education.

education or at the local board of education level. Foundations also supported curricular reforms to coincide with the efforts of the National Science Foundation but many of these efforts were put to the side. Some of these efforts however were continued at the local level by smaller foundations through summer workshops and specialized professional development offerings (Hammack & Anheier, 2013, pp. 98-99). The larger foundations supported the work and the creation of national testing and policy organizations as a way to leverage their funds for a larger impact on the national level. The Education Testing Service (ETS), the National Assessment of Educational Progress (NAEP), and the Education Commission of the States (ECS) all received significant start-up support during this time and they survive to this day (Cheek & Quiriconi, 2011, pp. 88-101).

The Ford Foundation also shifted from national to local-level initiatives aimed at empowering local communities (Adloff, 2010, pp. 300-301; Hammack & Anheier, 2013, p. 99). The most famous example was Ford's involvement in New York City schools in the late 1960s. Using the Ocean Hill-Brownsville schools in Brooklyn and Intermediate School 201 in Harlem as pilot sites, the Ford Foundation pushed for them to have community control of the schools. Without going into tremendous detail because this is not the focus of this chapter, the project caused an uproar among teachers (after many of them were arbitrarily fired) and many others and ultimately resulted in major teacher strikes that closed all of New York City schools for 36 days in the fall of 1968 (Ravitch, 2000 [1974], pp. 329-378).

Already in the mid-1950s with many foundations active in several political issues, both Republican and Democratic members of congress proposed legislation to curb the political spending of nonprofit organizations by denying them tax-exempt status if they were influencing legislation or intervening in a political campaign. Although this legislation did not become law, the interest in the political activities of nonprofits (including foundations) continued to grow. This led to Congressional hearings in the mid-1960s on "the financial misbehavior by many foundations" and to the Tax Reform Act of 1969 (Hammack & Anheier, 2013, pp. 81-83, quote p. 82). The Ford Foundation's involvement in the decentralization movement of the New York City schools was a key part of the congressional investigation into foundations with many members of congress feeling that "Ford had crossed the invisible boundary separating

tax-exempt charitable work from political advocacy” (Reckhow, 2013a, pp. 26-27).

The Tax Reform Act of 1969 created a much stricter set of regulations for foundations than for other nonprofits thereby clearly defining the difference between the two. The word “foundation” is a tax law term meaning donor controlled or endowed organization that usually has a single source of income and does not demonstrate public financial support by having a high enough number of donors³⁸ (Toepler, 2006). The Act included several prohibitions against “self-dealing,” more rules for donors regarding what qualified as a tax-exempt charitable deduction, a “pay-out” rule that specified the minimum percentage³⁹ a foundation had to give annually, annual public reporting requirements, and many new restraints on political involvement (Adloff, 2010, pp. 301-305; Hammack & Anheier, 2013, p. 83; Toepler, 2006, pp. 325-327). In the years immediately following the Tax Reform Act of 1969 due to the new regulations and the economic stagflation of the 1970s, there was a decline in the number of U.S. foundations (Toepler, 2006, pp. 326-327).

Corporate philanthropy however nearly doubled from \$252 million per year in 1950 to \$482 million per year in 1960 and doubled again in the early 1970s to roughly \$1 billion per year (in current dollars- not adjusted for inflation). Corporate giving shifted from supporting mainly large funding campaigns such as the Red Cross or United Way to supporting independent causes and initiatives. With this came a professionalization of corporate giving. With the many protest movements of the late 1960s and early 1970s, many corporations were blamed as being part of the problem of major issues such as the Vietnam War, women’s rights, or civil rights. In response, businesses started to look for ways to ward off social critics and further state involvement. “In 1971 the Committee on Economic Development issued a report on ‘The Social Responsibility of Business Corporations,’ which concluded: ... Business is being asked to assume broader social responsibilities than ever before and to serve a wider range of human values. Business enterprises, in effect are being asked to contribute more to the quality of American life than just supplying quantities of goods

38 Based on a formula regarding the assets and income of a nonprofit organization, the IRS determines if enough of the incoming funds to the organization are coming from a high enough number of people to qualify as a public charity. If not, it is considered a foundation.

39 Minimum payout was either all income or 6 percent of asset value, whichever was greater. In 1980s this was changed to a flat 5 percent, allowing them to keep excess income.

and services.” The U.S. Chamber of Commerce also noted that not meeting these new responsibilities could result in government action later (Himmelstein, 1997, pp. 22-25, quote p. 25).

As the expectations of businesses grew in the late 1960s and early 1970s, many corporations answered them by increasing their philanthropic contributions. Many corporate leaders however started to doubt that simply improving on their social responsibilities would quell the intense level of criticism they were receiving from some public groups. This led to a new direction for many corporate leaders who felt that the unions were too strong, the regulatory environment too strict, and the government too big. To address these concerns, many corporations came together to invest in political advocacy aimed at a conservative agenda including tax and spending cuts. To do this, they gave campaign contributions to Republican candidates for congress and conservative think tanks and they created the Business Roundtable to advocate for corporate interests. This new era of Corporate Conservatism “did not diminish support for corporate philanthropy; indeed it provided new reasons for it.” By simultaneously pushing for tax and spending cuts and increasing their corporate giving, corporations could cut down on big government and encourage the growth of the nonprofit sector to replace it (Himmelstein, 1997, pp. 25-27, quote p. 26). The increase in corporate philanthropy would have a great impact in the 1980’s as public education policy became a heated national issue.

Corporations were not alone in supporting this new conservative agenda. Many foundations were also active, especially in K-12 education. Starting in the 1950s but gaining much more traction in the 1970s, conservative donors started to fund a “back-to-basics” movement in education, arguing that education needed to be refocused on the subjects of mathematics, science, history, and languages instead of the more Progressive courses of study that emphasized life skills and leisure activities. These conservative donors along with some corporations funded nonprofit organizations that promoted traditional education and specifically focused on an “elite” strategy of distributing their limited funds among journals, magazines, academic programs, and research. With this strategy, they were able “to place their ideas in front of an elite audience of journalists, academics, professionals, and policymakers” or the people who could carry their ideas the furthest. K-12 education was a natural pick for the

conservatives because the field was strongly influenced by liberal ideology and thus an ideal field for them to be the outside critics. Aside from their traditional curricular preferences, the conservative donors also started to promote market-based school choice initiatives (Lenkowsky & Piereson, 2007, pp. 353-360, quote p. 359).

Interestingly, public education was one of the areas in which corporations pursued their agenda for tax and spending cuts and smaller government. In reaction to the community control of schools movement of the Ford Foundation and the resulting teacher firings and major strike, the teacher power movement of the 1970s was born and political activity became a mainstay of both major teacher unions (National Education Association- NEA, and American Federation of Teachers – AFT). In 1976, the NEA supported the Democratic presidential candidacy of Jimmy Carter. Once he was elected he kept his promise to the union to establish a federal level Department of Education with a secretary position to be added to his cabinet and started a new era of federal involvement in education. For the teachers union, this also started new relationships with democratic politicians who would promise specific political favors in trade for their support. “Both the NEA and the AFT tended to favor the policies of the Democratic Party. This left the Republican Party without any clearly defined educational constituency.” As a candidate for President, Ronald Reagan adopted the conservative agenda of cutting big government by vowing to abolish the U.S. Department of Education (Spring, 1997, p. 396).

Arguing for greater accountability and cost-effectiveness, business also pushed for education reductions at the state-level. In both California and Massachusetts for example, the business community pushed for tax cuts that affected school funding. Nationwide, business councils pushed for government spending cuts (Kanter, 1999, p. 3).

In sum: “Within the span of only two decades, educational policy had shifted from winning the scientific and technological war with the Soviet Union to winning the War on Poverty” (Spring, 1997, p. 355) Corporate involvement in public K-12 education in the U.S. however, was not much different in the 1960s and 1970s than it was in the previous decades. Although there were many new laws and legal rulings to promote equality in education, they reinforced the view that vocational education was

for students of low academic ability thus making vocational programs unattractive for many employers.

During this time private foundations were minimally involved in public education; however the involvement of the Ford Foundation in the decentralization of the New York City school system stoked the interest of Congress. It was also a key cause for the Tax Reform Act of 1969; which would have lasting effects on the foundation and nonprofit sectors. Corporate philanthropy continued to increase during the 1960s and 1970s to fulfill the expectations of the public regarding their social responsibilities. It continued alongside the conservative political agenda as a way to avoid big government and fueled the growth of external CSR that would become a cornerstone of American corporate philanthropy.

Comparison of the 1960s and 1970s in Germany and the U.S.

In both Germany and the U.S., the involvement of companies in public K-12 education did not experience major changes in the 1960s and 1970s but smaller changes through what Streeck and Thelen (2005) refer to as gradual transformation. In vocational education, the German firms continued their role as being the providers of firm-based vocational education. Even though new laws were enacted and left-leaning governments tried to change this to some degree, the core institution of them providing training remained and was actually further institutionalized during this time. With the exception of the short foray of some businesses into results-based education contracts in the U.S., business continued to have a minimal role in public K-12 education both from a vocational and philanthropic perspective. In both countries however, other changes were afoot.

It seems that in Germany, no matter what the educational or economic problem was, firm-based vocational education training programs were leaned on to fix it. From the immediate years after WWII when there was high youth unemployment and a country that needed to be rebuilt, to building up the workforce to handle the high number of expected retirements and the personnel demands of the “Wirtschaftswunder,” to the challenge of Sputnik and to the economic malaise of the 1970s, the firm-based training programs were called upon as a remedy. In the U.S., changes to the general

education track and often with a focus on students that were seen as most talented were usually the targets of new policy remedies. This was the case from Sputnik to the War on Poverty. In both countries, however equality of educational opportunity concerns changed that to some degree.

Equality of educational opportunity was a major issue in both countries during the 1960s and 1970s. In the U.S., vocational education programs were tapped as part of an effort to provide educational settings for special needs students, which furthered the stereotype of vocational education as a place for low-achievers and alienated businesses from partnering with them. In Germany, as unions and the SPD pushed for more school-based vocational training to provide students with a broader knowledge and skill base, businesses offered to do the same which was welcome by the state-level governments in an effort to control costs. This created two types of vocational training with the state-run training viewed as being for students who were not selected by business and therefore inferior. This also coincided with new laws regarding the education of special education students and training guidelines that stipulated that they were to have access to full vocational training programs with the net result that many special needs students ended up in the state-run vocational schools. In both cases, state-run vocational education was seen as a place for students who were considered weak academically and those with special needs. In Germany this along with the new laws regarding the training of people with special needs had the effect of businesses training far fewer people with special needs. In the U.S., this furthered the lack of involvement of businesses in vocational training at the high school level.

There was not much evidence of corporate philanthropic involvement in public K-12 education in either country but there were some changes in the 1960s and 1970s that would have lasting impacts on the philanthropic sector. In Germany, however, there was the entrance of new models of foundations such as Bosch or Bertelsmann. They did not see their roles as what Anheier and Daly (2006) describe as complimentary to the state or part of the traditional corporatist foundation model but as parallel to the state and offering alternative options to the mainstream (Anheier & Daly, 2006b, pp. 17-20). In this way, these newly created “liberal” corporate foundations were entities formed by businesses that were offering alternative ways to solving social problems. There was considerable growth in the foundation sector in Germany during these

years. In the United States because of new laws and regulations, the foundation sector growth slowed. Corporate philanthropy; however, grew substantially as corporations started to embrace the idea of corporate social responsibility and a conservative agenda aimed at reducing taxes and government.

After the Tax Reform Act of 1969, American foundations were strictly regulated with regards to the amount they must expend each year and public reporting on their assets and expenditures, and the prohibition of political lobbying. From then on, foundations were also prohibited from owning more than 20 percent of a given corporation—this is a big difference compared to Germany where such rules have never been adopted and in many cases even today, several foundations own the majority share of large corporations (Strachwitz, 2009, p. 130). Because of this and other restrictive laws and extensive administration and oversight, aside from being classified as liberal, the U.S. foundation sector can also be considered a state-controlled foundation sector (Anheier & Daly, 2006a, pp. 50-52).

In essence, there were no major changes to the involvement of corporations in public K-12 education in Germany or the U.S. but there were many other changes in laws regarding education, as well as foundations. There were changes in policies regarding equality of educational opportunity. There was also a growing public sentiment in the U.S. regarding the social responsibility of corporations at the same time many corporations started to adopt a more conservative agenda—all of which laid the groundwork for the role of corporate involvement in education in the 1980s and 1990s.

1980s Through the 1990s

Corporate Involvement in Education in Germany

Coming off the heels of the reforms of the late 1960s and the 1970s, the early 1980s were not focused on major changes to the dual vocational training system. Instead, there were concerns about the ability of the system to meet the demand for training places among students seeking placements. In 1982, the education ministry (BMBF) of the outgoing SPD-FDP coalition government issued a report that voiced concern

about a shortage of apprenticeship placements. The incoming CDU⁴⁰-FDP coalition's report the very next year spoke glowingly of industry's ability and responsibility to fulfill its job of providing enough apprenticeship places. Key here is that the administration of Chancellor Helmut Kohl was demonstrating its belief that industry, not the state or state-led interventions, would be able to address the problems of apprenticeship placement shortages. The BMBF minister at the time also indicated a shift away from policies focused on equality of opportunity in education to the more conservative foci of individual personal responsibility in education and the need to bring more competition into the education system (Busemeyer, 2009, pp. 106-109).

By the end of the 1980s, the apprenticeship training placement shortage had largely dissipated with the exception of some regions and sectors. This may have been the result of an agreement between the federal government and the employers associations where there would be less regulation of firm-based training in trade for an increase in dual training positions (Casey, 1991; Thelen & Busemeyer, 2008, p. 13). This may also be partially explained by the decrease in applicants for the dual vocational training places training that started in the mid-1980s (Baethge, 2003, pp. 539-542). As this concern about the quantity of training placements started to fade, focus was placed on the quality of the training the apprentices received. As the education ministry shifted from CDU leadership to FDP however, the belief in the ability of the market and the firms themselves to take responsibility for training was further stressed. The unions expressed concerns about the quality of the training, fearing that firms were poorly training apprentices in the job areas they had expanded during the 1980s as a way to bring down the costs of the training and to ultimately bring down the wages they would have to pay their workers. The unions continued to advocate for more state involvement in the monitoring and regulation of the firm-based training of apprentices as a way to ensure the quality of the training they received. This was a shift from their earlier positions that the state should provide more of the actual training through state-run schools. The SPD opposition expressed similar quality concerns and also proposed some financial levies to ensure the quality of the training. Although the proposal was never passed, a strong signal was sent that quality mattered (Busemeyer, 2009, pp. 110-115).

40 Technically CDU/CSU-FDP but in an effort to shorten it, it is written as CDU-FDP

The reforms of 1970s increased the number of students graduating with the credentials that enabled them to go to university (*Abitur*) but many recent university graduates were having trouble finding employment in the early 1980s. Because of this dilemma, the new CDU-FDP administration also faced the challenge of making the dual vocational training system more attractive to students who graduated with *Abitur* as a way to prevent more unemployed academics (Busemeyer, 2009, p. 107).

To do so, the administration, with the support of industry, proposed creating a dual vocational training system that was differentiated based on the academic abilities of students. For students deemed academically weak, they would receive a shorter, more practice-oriented training with less theoretical or scientific knowledge required. For the more academically oriented students (i.e., those with *Abitur* or high grades), they would receive longer training with stronger academic and theoretical components with more opportunities for advancement. The unions were skeptical of such a proposal because it would decrease the opportunities available to students graduating with lower levels of secondary education and argued that a broader training in key jobs was necessary for all (Busemeyer, 2009, pp. 118-120).

While the number of dual training placements experienced some peaks and valleys in the 1980s, the number of vocational training opportunities for disadvantaged students through the newly created state-run programs grew exponentially from 2000 participants in 1982 to 24,000 in 1986. This was seen not as a response to the crisis in the number of apprenticeship training positions but as a welcome way to support people with disabilities and other disadvantages by the unions, the federal administration, and industry (Busemeyer, 2009, pp. 120-121).

This growing role of the state in the provision of vocational education would only increase as East and West Germany were reunified. Germans often refer to this as the *Wende* or the “change” for East Germany from a socialist ruling party government with a planned economy to a democracy with a market economy. 1990 and the years immediately following it were full of policies and actions designed to transfer many of West Germany’s institutions to the former East Germany (Deutsche Demokratische Republik- DDR). Some of these policies were quickly implemented but others

resulted in ongoing intervention and investment by the state. Although the large former DDR companies were able to train many apprentices and help to meet the demand for training placements, the smaller companies and tradesman were unable to meet this demand. During the DDR time, these smaller firms did not play as much of a role in training; therefore their ability to train was not as highly regarded as their West German colleagues and demand for their goods was low. To ameliorate this problem, the state offered various financial incentives for firms to take on apprentices, developed apprenticeship programs outside of the firms, invested in the qualifications of the trainers, and supported additional teaching materials. Despite funding all of the initiatives mentioned above, the transition to a West German style of dual vocational training continues to be rough and continues to require substantial state support mainly because such a system cannot simply be transferred without the willingness of the firms to cooperate with each other (Baethge, 2003, pp. 553-557; Busemeyer, 2009, pp. 129-133).

In the late 1990s as the economy slowed down and there were not enough training places in the former West Germany, the ability of industry to solve the placement issues, especially now with the high unemployment in the East was questioned (Culpepper, 1999; Wagner, 1999). The administration put forward a plan to reform vocational education with a focus on flexibility and modernization. Building on many of the same points as they did in the 1980s, a key focus was the creation of differentiated paths within the dual vocational training system with more of a focus on the needs of business however there was also a new dimension- the desire for academic education and vocational education to be recognized as equal. The unions saw this new development as positive because it provided students with more opportunities. Industry and the administration also saw this as beneficial because it had the potential to make the dual vocational training attractive to students with *Abitur*. The unions continued to be against the differentiation of training that resulted in lower level qualifications. SPD continued to argue for more state financing and regulation of firm-based training. Industry continued to fight this point arguing that it was able to solve the crisis in the 1980s on its own and would be able to do it again, without state intervention and bureaucracy (Busemeyer, 2009, pp. 139-140, 143). Although there was strong support for differentiated models among businesses and the administration, by the end of the 1990s, with few exceptions, dual vocational

training profiles had limited amounts of specialization or differentiation (Thelen & Busemeyer, 2008, p. 16).

The *Wende* also kicked off the movement to change the school structure in Germany from the traditional three-tiered secondary school system towards a two-tiered system. As the East German states, started to adapt their school systems to the West German school models, there was much back and forth about the structures that would work best given East Germany's school structure at the time. Although the East German system was known for having a comprehensive secondary system (where all students attend the same types of secondary schools), the reality was that it was highly differentiated with a limited amount of students able to attain the more academic *Abitur*. The ability of a student to continue on was contingent on academic and social needs and perceived political orientation. As a result when the country was reunified, many of the East German states adopted a two-tiered school system consisting of a Gymnasium for students deemed to be academically strong and an integrated secondary school for both the *Haupt* and *Real* school-levels (or those at the lower and middle levels of academic ability). At the same time, some of the West German states also started to experiment with policies aimed at changing the structure of their secondary school systems but most of them were unable to come to an agreement during the 1990s (Edelstein & Nikolai, 2013). Some of the desire to change the structure in the West German states also reflected the changes in the enrollment of students in the different levels of schools. Between 1955 and 1995, the proportion of students attending the *Hauptschule* decreased from 74 to 25 percent; while the *Realschule* and Gymnasium enrollment increased 18 and 15 percentage points respectively (Nikolai & West, 2013, pp. 61-62). Important to note here is that the shift in students also affected the levels of academic preparation of the apprentices businesses would receive.

Industry started to become worried about the growing share of students opting for higher education instead of dual vocational training programs. The rising costs of training were seen as less of a problem than the growing share of students, especially in the West that were attending higher education instead of pursuing dual vocational training. This drove industry to support policies that recognized vocational and academic education as equal as a way to potentially recruit students with the *Abitur*.

They wanted to address the skill shortage through the dual vocational training system, not through an increase of students going to university (Busemeyer, 2009, p. 144).

Some argue that the early 1990s were a bit of a turning point for training in the dual vocational training programs because of the growing costs associated with training. For example, Karin Wagner (1999) argues that until 1991 there was a balance between the costs firms incurred and the benefits they reaped from training. However, after the early 1990s, the costs exceeded the benefits thereby making it less beneficial for firms to train apprentices and fueling the shortage of training places that plagued the late 1990s. She points to some key reasons for the increase in costs including: an increase in wages (the costliest part of taking on an apprentice), a reduction from a 40 hour to a 35-hour work week, an increase in the time spent in vocational schools, and broader training requirements for the firm-based portion -all of which reduced productivity time (pp. 49-53).

Martin Baethge (2003), points to three major factors for changes to the vocational training system: (1) a changing work and management structure in the face of global competition, (2) a shift towards a service-based economy, and (3) changes in technology and the knowledge-based society. The changing work and management structure refers to changes since the 1990s in the workplace that favor people with more broad-based knowledge and flexibility to work with others in teams and to be globally competitive in cost structures, which make it difficult for larger companies to increase or even continue to offer dual vocational training. The shift towards a service-based economy and away from goods-producing economy represents a shift towards jobs that do not require a dual vocational training style of training. Lastly in the information technology and knowledge-based society that started to take root in the 1990s, higher qualifications and broader knowledge are seen as the way towards advancement and innovation and has led to more employers and future employees seeking routes to higher education (pp. 569-575).

This has had and will continue to have a profound effect on what Baethge (2006), refers to as the “*Bildungs-schisma*” (Education schism) or the stark divide between the vocational and more academic general education that has been part of Germany’s history since the 1800s. The higher level, academic preparation has traditionally been

focused on the personality of the student and providing them with ability to be more autonomous through the systemic acquisition of knowledge. The vocational preparation meanwhile was focused on preparing students for specific work skills based on the demands of the employers and necessary qualifications. As the information and service sectors increased and industrial production decreased, the employer demand grew for employees with analytical, communication, and problem-solving abilities – or the abilities that a higher-level academic preparation provides (pp. 24-27).

The percent of firms participating in dual vocational training in Germany decreased from 35 percent to 26 percent of all firms between 1993 and 2006. The greatest drop in firm participation was among the smallest companies; which traditionally made up the backbone of the German training system and thereby left the medium and large companies with the most power within the dual vocational training system. The decrease in participation also led to a situation where there were not enough apprenticeship positions offered. This resulted in ever more students taking paths besides the dual vocational training path and the state having to step in to offer additional educational opportunities in both the transition system and the higher education system (Baethge, 2003, pp. 546-553; Thelen & Busemeyer, 2008, pp. 9-12). It also left medium- and large-sized firms with even more leverage towards more firm-specific training that most benefits them; which is an enormous but gradual departure from the collectivist traditions of the German training system (Thelen & Busemeyer, 2008). The firms were not the only ones that were losing interest in training. Between 1992 and 2000 the percent of school students that expressed an interest in completing a dual vocational training decreased from 74.7 to 62.7 percent (BIBB, 2013, p. 26).

While some scholars point to technical changes in the economy as the major driving force behind these developments (i.e., the decline of manual work and the increase in jobs that require higher level cognitive skills), Wolf-Dietrich Greinert (1994) points to social change as a major hurdle as well. Since the 1970s, the push by parents and students for higher education was increasing and leading to more competition and pressure to achieve. They saw higher education as a better and more stable way to economic advancement and long-term employment. These developments also

resulted in an increase in the number of dropouts from the dual vocational training programs: apprentices abandoning the field after the completion of training (often to attend higher education institutions). This also led to a lowering of the entrance requirements for dual vocational training. For many employers however, the students coming out of the *Hauptschule* (lower secondary schools) simply were not prepared for the rigorous in-company training to become highly-skilled workers (Greinert, 1994, pp. 116-120).

The trends in German collectivist traditions in training were also related to the decline in collectivism among German businesses in general. Wolfgang Streeck (2009) traces the dismantling of Germany's corporatist tradition that had been the foundation of the governance of German businesses since the end of WWII to many factors starting in the 1980s and accelerating in the 1990s and beyond. He argues that the cross-shareholdings of banks and businesses; which created a collective shield from political and economic forces (i.e., hostile takeovers, unreasonable demands from unions), started to fall apart in the 1980s. The German banks, most notably Deutsche Bank, started to engage in investment banking to reap in more profits and decreased their role as stable providers of cheap credit and shareholders in German businesses. He further argues that this caused many businesses to also divest in their cross shareholdings in German companies; thereby becoming more like individual private actors. The focus turned to individual corporate profits, with some companies becoming more international as a way to avoid German taxes (Chapter 6). Adding to these developments was a decline in the percent of firms and employees with industry-wide collective bargaining and a precipitous decline in the percent of the workforce represented by trade unions from roughly 31 percent in 1992 to just under 20 percent in 2003 and a decline in the membership of businesses in employer or business associations (Streeck, 2009, pp. 38-39, 46-37).

The German corporatist model of training was also challenged during this time. Whereas in the 1970s and 1980s when there were not enough training places, the government, business organizations, unions, and others would have come together to form a solution, by the 1990s this was no longer the case. Some of this was the result of a lack of government intervention in the creation of training placements and some of this can be explained by the growth in vocational training provided by the

government. As a result of these developments, the traditional relationship in developing solutions to training placement supply shortages was undermined (Baethge, 2003, pp. 566-569).

As the traditional German corporatist system started to change, businesses started to approach their social responsibility to society in a new way. The Corporate Social Responsibility (CSR) and later the Corporate Citizenship (CC)⁴¹ movements that swept through the U.S. and later the U.K and some other European countries arrived in Germany in the 1990s but it took many years before it was really noticed (Backhaus-Maul et al., 2010, p. 30). Frank Adloff (2010) argues that as the corporatist system started to erode, the economic elite started to test the use of philanthropy as a way to influence society. For business, this meant the use of philanthropy in social, cultural, and sport initiatives as part of CC as a way to build better relationships and be recognized as being socially responsible by local elites. Philanthropy served as a way of building new bridges (p. 370).

The number of new corporate foundations in Germany also started to increase dramatically in the 1980s. With 152 corporate-related foundations founded in the 1980s, the number of corporate-related foundations grew to just over 450 or more than double the number in the 1960s. In the 1990s, the increase in the number of new corporate-related foundations was even greater with almost 300 founded in the decade⁴² (Junck, 2007, p. 37). This growth of corporate-related foundations was a part of the new CSR movement among German companies. For many of these companies, this also meant starting a corporate foundation. Examples of German CSR-style foundations founded in the 1990s include the Aventis Foundation, and the Schering Stiftung (Junck, 2007, pp. 27-30). Unlike the traditional German corporate foundations; which were founded by the family or main owner of the firm, this new type of foundation is founded by the corporation and is often linked to the communications strategy of the corporation. The CSR style foundations⁴³ are given an endowment and/or continue to receive funds from the corporation or the

41 For the differences between these terms, see: (Backhaus-Maul, Biedermann, Na hrlich, & Polterauer, 2010, pp. 20-25)

42 These statistics do not include the *Sparkassenstiftungen* because of their strong tie to the public sector.

43 In German: *Unternehmensstiftungen*

employees of the corporation (Junck, 2007, p. 14). The growth in corporate foundations paralleled the growth of foundations in Germany in general. There were 181 foundations founded in 1990, in 1995, there were 385, and by 2000, there were 681 new foundations (Bundesverband Deutscher Stiftungen, 2014a).

Both the Bertelsmann and the Robert Bosch Stiftungen also became more active in the area of K-12 education. The Robert Bosch Stiftung's Practical Learning in the School (*Praktisches Lernen in der Schule*) program of the 1980s was focused on making classroom learning experiences more relevant to daily life. In the 1990s, the foundation was involved in the renewal of the former East German school system (Theiner, 2014, pp. 166-167). The Bertelsmann Stiftung meanwhile started to annually give out an innovative schools award in 1996 and started a project called the "International Network of Innovative Schools" in 1997. Both of these initiatives were aimed at highlighting schools deemed to exhibit "Best Practices" in education. These best practices included the establishment of quality standards, evaluation methods, and the collection of data so that schools could be compared and could learn from each other (Hartong, 2012, p. 749; Höhne, 2012, pp. 250-251; Höhne & Schreck, 2009, p. 150). They were also well aligned with the recommendations of the *Bildungskommission NRW* (the Education Commission of North Rhine-Westphalia); which Reinhard Mohn, the former CEO of Bertelsmann participated in (Bildungskommission NRW, 1995; Höhne & Schreck, 2009, p. 150).

During the 1990s, Germany also started to participate in international assessments again. Since the First International Mathematics Study (FIMS) in the 1960s, Germany had not participated in any international assessments. Starting in 1995 however, Germany participated in the Third⁴⁴ International Mathematics and Science Study (TIMSS), the results of which were released in 1997. The results showed that Germany's students' abilities in science and math were below average when compared to their peers in most of the neighboring countries in the East, West, and North. Following the results of TIMSS, German states decided to regularly participate in international studies, including PISA; which would later cause a significant stir (Köller, 2009, pp. 138, 142, 147; Niemann, 2010, p. 65).

⁴⁴ Since then it has been called Trends in Mathematics and Science Study (TIMSS) and is given every four years.

In sum, changes in the role of business in vocational and general K-12 education in the 1980s and 1990s in Germany were not the result of major policy reforms but of ongoing changes in the economic and political environments. In the 1980s the focus in education issues shifted from equality in educational opportunities to a focus on the responsibility of the students themselves and the belief that business “knows best” when it comes to vocational training placements rather than the need for state intervention. Unlike the previous decades, all parties agreed that firms should be the providers of vocational training (Busemeyer, 2009, p. 144). The debates evolved more around how much state monitoring and financing of the firm-based training there should be and whether there should be differentiated levels of training based on academic ability within training profiles.

The state also started to play a much larger role in vocational training. The state-run vocational programs, which provided training for students who were unable to get a dual training placement and for students with learning needs, grew more than tenfold. After the *Wende*, the German government in an effort to promote the West-German style of dual vocational training provided many financial incentives to support its development. Although the state was trying to assist disadvantaged students, the bad stereotype of state-run training prevailed, leaving many of the students of these programs with qualifications that were not valued by industry and therefore more likely to be unemployed.

High unemployment, not enough apprenticeship placements, and increasing costs of apprentices led to the decrease in firms that participated in dual vocational training in the late 1990s. Meanwhile business leaders and others continued to argue that *Abitur* and dual vocational training needed to be recognized as equal as a way to encourage the more academically competitive students to also consider the latter. This coincided with an increase in the number and percent of students getting *Abitur* and the start of policy discussions about changing the secondary school structure to be more flexible and comprehensive and to be more like the “new” *Länder* (former East German states).

For some, this time period is also the beginning of the end of Germany’s corporatist

system and with this, a new era of business and elite domination in politics and society. In this light CSR initiatives started to evolve and included new efforts in corporate philanthropy or in Matten and Moon's terms, started to shift from *implicit* to *explicit* CSR (Matten & Moon, 2008). The 1990s were the start of a foundation boom and also a corporate foundation boom. Many of the foundations were CSR style foundations with a tie to the communications division of the company. There are also indications that K-12 education started to be an area of interest for some corporate foundations starting in the 1980s and 1990s. All of this happened just as Germany started to dip its toe into international assessments.

Corporate Involvement in Education in the U.S.

During his presidential campaign, Ronald Reagan vowed to abolish the Department of Education as a part of his promise to decrease government spending and to limit the intrusion of the federal government into state-level responsibilities. This was not to be however because of the political storm that ensued after the release of what would arguably become one of the most cited reports about the state of U.S. education – *A Nation at Risk* (Mehta, 2013, pp. 84-90; Ravitch, 2010, pp. 37-43; Spring, 1997, pp. 396-398). This report warned with strong language that “the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and a people” and “if an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war” (National Commission on Excellence in Education, April 1983).

According to the *A Nation At Risk* report released by the National Commission on Excellence in Education, America's lackluster academic performance and public schools were the root cause of the U.S.'s difficulties in competing in the global economy. “If only to keep and improve on the slim competitive edge we still retain in world markets, we must rededicate ourselves to the reform of the educational system for the benefit of all.” Interestingly, West Germany's gain over American firms in the market for machine tools was one of the reasons cited as a lack of economic competitiveness (National Commission on Excellence in Education, April 1983). By linking education to international economic competitiveness, a new set of actors

became intricately involved in education reform with the business community often playing a leading role (Mehta, 2013, pp. 103-104; Spring, 1997, pp. 397-399; Tyack & Cuban, 1995, pp. 33-34, 39). Many scholars have argued that faulty data were used to make these points and that the link between economic competitiveness and the quality of public education is weak at best (for a review of these points, see: Tyack & Cuban, 1995, pp. 34-37) but the focus here is on how actors, including the business community came together, why particular policy steps were taken, and how this affected future decisions.

The public interest in education after the release of the report and the media storm that followed it was immense. Public confidence in public institutions of all kinds had been falling since the early 1970s but for education they hit a new low after the release of *A Nation at Risk* (Mehta, 2013, p. 90). As an example, Gallup polls asked if “children today get a better—or worse—education than you did?” While 61 percent of respondents said *better* in 1973, by 1979, just 41 percent did. When asked about their public schools or the teaching profession, there were similar drops in public confidence (Gallup Poll Data in: Tyack & Cuban, 1995, pp. 30-31).

A Nation at Risk significantly altered the way education was discussed in the U.S. and the policies pursued as a result. The Commission’s report pointed to the content of the curriculum as being the major culprit in America’s low academic performance. It raised the concern about the number of students in the “general track” in high school, a track of course taking that was neither academic nor vocational but a mix of random courses that did not prepare them for college or careers. The percent of students in the general track went 12 percent in 1964 to 42 percent in 1979 and it exceeded the percent in the other two tracks. Furthermore, the Commission lamented that academic expectations within courses had decreased over time- that students could get away with doing far less but still get into college (Ravitch, 2010, p. 39). Some of the courses included in the general track were the result of earlier vocational legislation that encouraged the inclusion of vocational education courses in other tracks.

To address these concerns, the report called on states to increase or adopt academic standards and curriculum and to improve the quality of the teacher workforce among other reforms (Ravitch, 2010, p. 40; Spring, 1997, p. 397). With many states

answering this call and the federal government's encouragement, *A Nation at Risk* can be seen as the birth of the standards and later, the accompanying accountability movement. Democrats embraced this agenda because of the universal opportunities it could offer, while Republicans saw it as a way to put pressure on a public bureaucracy. The focus on new high standards is often seen as the beginning of the "Excellence for All" mantra that would dominate education policy for the decades to come. The "for all" portion emphasizes the focus not just on excellence or high standards for some but that there was also an equity emphasis (Mehta, 2013, pp. 4, 104-106). Along the same lines, came the Workforce 2000 report in 1987, which argued skill requirements were increasing a fast pace and that the majority of the new jobs created between then and 2000 would require at least some postsecondary education (Bailey & Morest, 1998, pp. 116-117).

A Nation at Risk also led to changes in the approaches of teachers unions. Although they were seen as and often were obstructionists to education reforms before the report, they recognized the significant shift in the policy landscape and especially the AFT, went on to support some aspects of the standards-based reform movement and some other reforms (Mehta, 2013, pp. 145-152). The unions and the Democratic party however continued also to advocate for more federal funding for schools serving poor children (Spring, 1997, p. 397).

The 1980s saw education reform efforts of all varieties blossom across the U.S. but ultimately; the standards-based reforms became the most popular type of reform. Before federal legislation started to encourage it in 1994 through the reauthorization of the Elementary and Secondary Education Act (ESEA), 42 states already had some variety of standards, accompanying assessments, and accountability measures. (Mehta, 2013, pp. 156-157)

The state-based standards initiatives also bode well for President George H.W. Bush's Charlottesville Summit in 1989 and his *America 2000* strategy. Governors, business leaders, and higher education officials developed a national (note: not federal) vision and goals for K-12 education at the summit including reducing the dropout rate, improving science instruction, and improving academic performance on assessments.

Many of these goals were included in President Bush's *America 2000* strategy. It marked a turning point for federal involvement in education. Tying education performance concerns to the needs of the economy gave the federal government the legitimacy to be more active in schools, even though this has traditionally been an area reserved for the states. It was also an area of extreme interest for the public for presidential elections. Education had been of little interest to voters in the 1960s and 1970s but by the mid 1980s it was in the top third of the most important issues for voters in making their selection for president and therefore, could not be ignored—even by a Republican president whose party usually pushed for a smaller role for the federal government (Mehta, 2013, pp. 158, 190-194). It was also critical for Democrats who's largest block of delegates to the Democratic Convention consisted of teachers unions members (Mehta, 2013, p. 139).

One piece of the *America 2000* strategy included “model schools.” In July of 1991 the New American Schools Development Corporation (NASDC) was formed to develop 535 schools (one in each congressional district) that would have bold new education plans and designs with an emphasis on reforming the whole school. The funding for NASDC came from private corporations and the board was composed mainly of leaders from some of the largest corporations in the country (Spring, 1997, pp. 398-399; Tyack & Cuban, 1995, pp. 110-111). Despite millions of dollars and mountains of effort, the results of the NASDC schools were minimal at best (Mirel, 2002).

America 2000 included legislation that proposed national standards and achievement tests tied to them. Many business organizations endorsed the idea of national standards and tests because of reports and policy analyses that suggested America's main issue was an overly fragmented set of educational expectations. Congress; however, did not agree with President Bush's proposed legislation because they were left out of the Summit and because both Democrats and Republicans did not feel it adequately addressed their concerns. Republicans saw this as federal intrusion into the education responsibilities of states and localities. Democrats did not see anything that addressed the need for greater equity in education for poor and minority students, namely additional funding for the poorest schools and a focus on tests that could be detrimental to students (Mehta, 2013, pp. 194-205).

Although the reforms based on national standards did not muster enough support for Congress to pass the legislation from *America 2000*, the focus on standards-based reforms did not disappear. Instead, after much debate among many actors, the focus shifted to state-level standards and assessments and their measurement, which were ultimately included in *Goals 2000 Educate America Act* and the *Improving America's Schools Act* of 1994 (reauthorization of ESEA). With the passing of this act during President Clinton's presidency, standards-based reform at the state-level was funded and required in order to receive ESEA funds (Mehta, 2013, pp. 224-232; Spring, 1997, pp. 399-400).

By tying education to economic competitiveness, employers had become key actors in education policy making. One of the numerous committees on education, the Task Force on Education and Economic Growth released a report in 1983 that stated: "If the business community gets more involved in both the design and the delivery of education, we are going to be more competitive as a country" (quoted in: Spring, 1997, p. 398). Starting in the mid-1980s business leaders came together with state leaders on hundreds of commissions and task forces to set goals for education and to develop ways to attain these goals. Business leaders no longer saw education simply as a field needing reductions in spending to lower taxes but as a field that needed to improve its quality to improve the training of future workers (Mehta, 2013, pp. 87, 187). Some of the reports issued from the commissions were critical of vocational education programs for being of low academic quality, narrowly focused, outdated, and for a low level of teacher quality. Although not all employers concurred, the leaders of "high performance workplaces" suggested to congressional education committees that their new hires were lacking academically but that contextual learning (via practical experiences) would help to improve their skills. (Hayward & Benson, 1993, pp. 16, 18).

The Forgotten Half, a 1988 report from the William T. Grant Foundation's Commission on Youth and America's Future also argued that with the focus of the U.S. educational system increasingly directed at students going to college, half of the student population was effectively ignored. They were not served well with vocational options at the secondary level. In addition to improving the secondary

vocational paths, and to better integrate academic and vocational offerings, the report also called on employers and other institutions to create partnerships with schools to better prepare youth for the workplace. Many of these same points were put forth in a subsequent report in 1990, *Americas Choice: High Skills or Low Wages*, from the Commission on Skills in the American Workforce (Bailey & Morest, 1998, pp. 116-118).

Business leaders were concerned about the lack of practical experiences students were receiving. There were several worrying economic trends in the 1980s that led the business community to focus on the skill development of students. There was a sharp drop in productivity growth, which started in the 1970s and resulted in a slowdown in the growth of wages. Additionally, there was a growing gap between the wages of people with and without college degrees. With the decline in the percent of students participating in vocational education and studies showing there was limited benefit for their participation, there was a growing interest in improving the connection between school and work-based training (Stull, 2003; paragraphs 3-4, 7). High youth unemployment rates and a long transition time between school and jobs with a career path also led to many new discussions regarding the importance of work-based experiences. In response to these concerns, the School-to-Work-Opportunities Act (STWOA) was passed in 1994 (Grubb & Lazerson, 2007, p. 163; Hershey, 2003, paragraph 1; Spring, 1997, p. 400). Programs qualifying for STWOA funds had to include school and work-based learning and activities to connect the two, as well as, be structured so that students could choose “career majors” which would be tied to higher education and employment opportunities (Stull, 2003; paragraphs 9-10).

By 1998, there were a total of 1,894 business and school partnerships across all 50 states, the District of Columbia, and Puerto Rico (Hershey, 2003; paragraph 6). While some researchers cited many successful partnerships between businesses and their local education communities in arguing for the reauthorization of the STWOA in 2001 (Hughes, Bailey, & Mechur, 2001), other researchers argue that STWOA was a failure as evidenced by its short lifespan of five years and the fact that it was not reauthorized by Congress (Grubb & Lazerson, 2007, pp. 47, 149, 163).

While there may have been some highly successful partnerships between schools and

local businesses, the pattern of business involvement as a provider of training at the secondary level was not institutionalized during this time. According to Alan M. Hershey (2003), although the ideal STWOA program consisted of well-coordinated school- and work-based activities with students participating in internships related to their “career major,” few of the programs actually worked like this. Between 1995 and 1999, there was no significant growth in the employer provision of training through paid or unpaid internships. Most of the employer partnerships consisted of low-intensity experiences such as job shadowing where students would follow and employee around for a day or so. Additionally, changes to the curriculum also tended to be minor with fewer schools opting for integrated curricula and a required workplace experience. For the more intensive STWOA programs to work much more coordination and agreement on program design was needed. Much of this coordination fell to educators who had limited time for the amount of work required. In 1996, roughly two percent of students participated in programs that combined school- and work-based learning and provided career development activities. By 1998, it was still less than three percent. Although many states agreed to continue funding the business-school partnerships beyond the federal grant period, many did not. As the federal funding began to dry up by 2000, many of the local business-to-school partnerships did as well (Hershey, 2003; see also: Hershey, Silverberg, Haimson, Hudis, & Jackson, 1999). Interestingly, the firms that participated in the STWOA programs often cited philanthropic purposes as the motivation for their participation, not recruiting employees (Bailey, Hughes, & Barr, 2000, pp. 50-52).

Outside of vocational involvement, the business community was very active in K-12 education in the 1980s and 1990s. As mentioned above, they were very well represented on task forces and commissions focused on education issues. Education became a major issue for corporate philanthropy starting in the 1980s just as the corporations started to benefit from the Reagan administration’s tax cuts. Corporations were encouraged to compensate for some of the federal budget cuts by increasing their corporate giving from one percent of pretax profits to two percent. Increasing corporate giving was seen as a way to make the nonprofit landscape flourish as an alternative to big government. It was argued, “if corporations did not step in, they risked increased public hostility and they would lose an opportunity to shape the social agenda.” Between 1978 and 1987, corporate giving almost doubled in

real dollars (Himmelstein, 1997, pp. 27-28, quote p. 27).

The Business Roundtable, which was one of the leading organizations to represent corporate interests started a ten-year commitment to K-12 education reform in 1989. Through this initiative, the Business Roundtable provided member businesses with information on the activities of exemplary businesses in K-12 education along with blueprints for how other businesses could achieve the same. They advocated for long-term commitments to education initiatives that were focused on changing the education system. Corporations seemed to heed their advice as corporate giving to K-12 education almost doubled in the late 1980s and early 1990s (Himmelstein, 1997, p. 28).

Businesses also participated in “adopt-a-school” programs at the local level throughout the 1980s. Through these programs, businesses often helped to plan out educational goals to meet the needs of the labor market. In Boston a formal relationship between businesses and schools was established. The schools would improve the quality of the graduates to meet the needs of employers and in turn, local businesses would give priority in hiring to graduates of Boston schools. Some other cities established these formal compacts as well (Spring, 1997, p. 398).

Companies were not alone in supporting education initiatives in the 1980s and 1990s. Private foundations were also active in funding education reforms, research, and advocacy efforts (Hess, 2005b, pp. 25-26; Lenkowsky, 2005, pp. 93-94).

The largest single donation towards America’s public schools came from Walter Annenberg in 1993. Through the Annenberg Challenge, he gave \$500 million over five years to some of the neediest school districts in the country. To receive the funds, the districts had to create partnerships with intermediary organizations and raise matching funds with outside organizations. The intermediary organizations were able to choose the strategies they would use to improve education with the guiding theory that the local organizations knew best what their schools needed (Colvin, 2005, pp. 31-32). Notwithstanding, the huge sum of money Ambassador Annenberg gave to this initiative and the additional \$600 million raised in matching funds, the Challenge has often been cited as a disappointment (Hess, 2005b, pp. 4-5; Ravitch, 2010, p. 195; Reckhow, 2013a, p. 30). Some have noted however, that the Challenge resulted in

stronger relationships between the schools and the community. Further, the transparency of the Annenberg Challenge through its self-imposed evaluation and its publication, provided invaluable information to educators and philanthropists for what to do and what not to do in the future (Colvin, 2005, pp. 31-32; Lagemann & Forest, 2007, pp. 64-65).

As the Annenberg Challenge was running its course in the late 1990s many new ultra-wealthy philanthropists started new foundations. Many of these new philanthropists, such as Bill Gates, Eli Broad, or the Walton Family were entrepreneurs who saw themselves as innovative agents of change in the business world and wanted to apply their “know how” to major societal issues. They had “little patience for educational bureaucracies, traditional approaches to giving, or pleas to give the schools more time.” They preferred a hands-on approach to giving with a business-style focus on measurable results and accountability. Between 1998 and 2002, these new foundations became the top foundation funders for K-12 education, replacing the traditional education funders such as the Pew Charitable Trusts, the Rockefeller Foundation, the Lilly Endowment Inc., and the David and Lucille Packard Foundation (Hess, 2005b, pp. 5-6, quote p. 6; Ravitch, 2010, pp. 196-198; Reckhow, 2013a, pp. 29-30). Unlike the more traditional funders of education, the new funders did not review proposals submitted to them, rather, they decided what they wanted to achieve and which organizations they wanted to work with to do so. They are known for practicing “venture philanthropy” leaning on the models of venture capitalism, they expect their investments (donations) to lead to measurable results and they play an active supporting role in the process with their grantees (Ravitch, 2010, p. 196; Reckhow, 2013a, p. 31). It is important to note that while the “new” education funders noted above are often associated with large corporations, these are all private foundations; whereby the individual or family used their own funds to start the foundation. They are not corporate foundations and it remains an open question how or if this change in the guard of major foundation funders of K-12 education has affected corporate philanthropy’s role in education.

Summing up: Unlike the previous decades, the 1980s and 1990s saw significant corporate involvement in K-12 education. Kick started by productivity and economic issues and the infamous *A Nation At Risk* report, the early 1980s can be seen as the

start of intensive business involvement in education in the U.S. It can also be seen as the birth of the standards-based accountability movement that dominates education policy in the U.S. even today. Since the 1980s, companies have been actively involved in education in many ways—on education commissions, committees, and taskforces, in operating the NASDC schools, in special partnerships with schools and districts, and through a tremendous increase in corporate philanthropic spending in the area of K-12 education.

Businesses also became active in vocational education through the School-to-Work-Opportunity act but usually through less-intensive relationships with schools and students. It appears that this involvement was not widely institutionalized after the STWOA expired. Vocational education also suffered a bit during this time as it lost ground to academic tracks and courses of education because of the ever-increasing focus on the new standards and assessments.

Private philanthropy increased its investment in K-12. Many of the traditional education funders initially played lead roles, the Annenberg Foundation gave an unprecedented sum towards improving education, and lastly, many new fabulously wealthy actors entered the scene with their own ideas about how to approach an education system that seemed impenetrable but also offered an enormous challenge.

Comparison of the 1980s and 1990s in Germany and the U.S.

In both Germany and the U.S., the 1980s represented a shift to a more conservative and business friendly government. For the business community in both countries this resulted in more choices about how they would be involved in education. In the U.S., businesses went from being a minimal actor in K-12 education to being a dominant voice in education debates. In Germany, there was a reduction in the amount of state involvement in firm-based vocational training, giving businesses more control over how many apprentices they would train and how they would train them. The reduction in the corporatist structure also led to more *external* CSR initiatives including the formation of foundations.

In the U.S., the shift to a more conservative government resulted in major tax

reductions for businesses and cuts in government services. This resulted in a growth of corporate philanthropy as a way to polish their image and to encourage growth in the nonprofit sector as a way to avoid a resurgence of big government. For the U.S., this time was also marked by the *Nation At Risk* report and the call for the business community to become actively involved in improving K-12 education. In a way it was “perfect timing” given their increased commitment to corporate philanthropy. From then on, the federal government, which traditionally played a minimal role in K-12 education, was legitimized in education debates because of the link to the economic competitiveness of the nation. Meanwhile, the U.S. business community became a driving force in the standards-based reform debates that would dominate state capitals and Washington from the mid-1980s on and in local initiatives such as “adopt-a-school” programs. During this time, major traditional private foundations were also active in education but during the late 1990s there was a shift in the top donors in education. Many new large foundations came to the plate with more of a “venture philanthropy” approach to education funding. It remains unclear how this affected corporate philanthropy.

Starting in the 1990s, many business leaders also advocated for education to be more practically oriented. These concerns along with many other economic issues at the time led to the School-to-Work-Opportunities Act, a federal grant for programs that combined school- and work-based learning activities. The businesses that were involved tended to offer the least-intensive options for the work-based learning due to the high costs and coordination of more intensive programs and ultimately many of the STWOA programs faded away after the act was not reauthorized and the funding dried up. In sum, business went from being a non-actor in K-12 education to being an active voice in the direction of K-12 education but did not become a provider of vocational education experiences.

In Germany, during this same time, industry was able to gain more control over the process of firm-based vocational education. Because all parties now agreed that vocational training should happen in firms, the question was more about how much state monitoring there would be and with a business-friendly administration, calls to increase state-control did not have a supportive ear. This reliance on business to solve the supply of apprenticeship placement problems of the 1980s seems to have worked

and built additional confidence in the abilities of business to solve for economic and educational training problems. At the same time however and especially after German reunification, the state started to play an increasingly large role in the provision of vocational training for students who were unable to get an apprenticeship placement and for those considered to have special learning needs. By the late 1990s there were signs that the German corporatist system was unraveling. The increasing role of the state in vocational training, combined with an ever-increasing percentage of students seeking *Abitur*, declining membership in unions and industry associations, and the increasing costs of apprenticeships led to a decline in the number of dual training placements. This opened the door for companies to participate in education and other social endeavors in other ways, namely CSR.

Summary

In both Germany and the United States, the role of companies in K-12 education changed between 1945 and 2000. In Germany, although firms continued to play a large role in the provision of firm-based vocational training through the dual vocational training model, this role decreased significantly between 1980 and 2000. Simultaneously, companies started to become active in corporate philanthropic activities with a strong preference for education initiatives. This is a prime example of what Matten and Moon (2008) describe as a move from implicit to explicit models of CSR. In the United States, where companies traditionally did not play any role in K-12 education, by the year 2000, the business community and leaders were considered major players in education policy. This was especially the case in K-12 education, which was the recipient of many explicit CSR initiatives. Just as America started to have serious doubts about its K-12 system and after companies received large tax reductions, there was an increase in corporate philanthropy in K-12. That the two systems changed overtime should not be surprising but begs the question of how and why particular changes happened over time in the two countries.

As this chapter and many scholars have shown, irrespective of the political make-up of the German administration, the core institution of firm-based training has survived largely intact but it is dwindling in size. The governance of vocational education; however in Germany between 1945 and 2000 experienced many changes. It basically

went from a form of business organization self-governance, to formally recognized business organization-only governance, to more inclusive business organization dominated governance. During this last phase however, there was an increase in the role of state-run vocational education programs and a decrease in the participation of firms and students in the firm-based vocational education. This coincided with an economy shifting to more of a service and knowledge-based economy that valued many of the aspects traditionally found in the *Gymnasium* and as a result a higher demand for these skills. Sensing this shift, there was a growing interest among students and their parents in higher education options thereby decreasing the academic quality of the pool of applicants for firm-based vocational education. There was also a CSR movement that started to sweep across Europe and a boom in the creation of foundations in Germany. All together, this may have opened the door around 2000 for business to start to have more of an influence on education through corporate philanthropic initiatives as vocational education policy affected less and less students.

In the United States companies dabbled in vocational education between 1945 and 2000 but an institution of involvement never took root. They did however establish inroads into education and education policy through corporate philanthropic actions. Even when general philanthropy slowed down at times because of new legal restrictions, corporate philanthropy grew each decade of this time span. This was due to tax policies that expanded what counted as tax-deductible corporate philanthropy and because of the public's growing expectations of the social responsibility of companies. When one looks at corporate philanthropy in the immediate postwar years however, one can see that one of the major driving reasons behind investment in private colleges and universities was to ensure that there were providers other than the state for higher education. In essence that government would not become too big and powerful. This reasoning endured throughout the entire analysis and became a major driver of corporate philanthropic donations to conservative think tanks that advocated for smaller government and lower taxes. As these smaller government and low tax initiatives took root in the 1980s corporate philanthropic giving doubled. It focused on growing the nonprofit sector to make up for the loss of some government services and as a way to grow an alternative to government provision of services. After the *Nation At Risk* report was released in 1983, the country turned its gaze towards

reforming America's K-12 education system. The image of the business community being outside of government and seeking to provide alternatives to government and the tying of education to economic competitiveness concerns provided businesses with the legitimacy to become major actors in education. The business community acted upon this legitimacy by becoming active in education policy discussions and by drastically increasing corporate philanthropic giving to K-12 education. By 2000 after about 15 years of investing in education initiatives, the limited effects of the billion-dollar⁴⁵ Annenberg Challenge, and a new set of lead investors in K-12 education, corporate philanthropy was ripe for making some changes.

⁴⁵ Billion dollar figure includes both the \$500 million from Walter Annenberg and the matching funds.

TABLE 4.1: SUMMARY GERMANY

Late 1940s-1950s	1960s-1970s	1980s-1990s
Business/Industry Roles and Positions in Education		
<ul style="list-style-type: none"> • Provided standardized firm-based VET • Advocated for firm-based training/less school-based- less state involvement 	<ul style="list-style-type: none"> • Continue provision of VET • Against state involvement and standardization and broadening of VET profiles • Maintained veto-power over new training regulations • Some “new” style corporate foundations 	<ul style="list-style-type: none"> • Provision of VET, but declines in 90s • Support policies to make VET and academic education recognized as equal • Start of CSR • Growth of corporate foundations- some interest in K-12 education
Education System Themes		
<ul style="list-style-type: none"> • Decentralized, self-governed chambers favored over large state role in VET • Incentives for apprenticeship placements provided by state 	<ul style="list-style-type: none"> • Broader VET education paths • Bildungskatastrophe report • Equality in education opportunities • Vocational Training Act 1969 • VET training through state-run-schools • Push for Comprehensive high schools and to reduce tripartite system • Training quotas set leads to more firm-based apprentices 	<ul style="list-style-type: none"> • Limited state intervention in dual vocational training- more business control • Attempts to make VET attractive to <i>Abituren</i> • Some experiment with policies to change tripartite structure • Support idea of differentiated VET profiles • Growing role in provision of VET for special needs • Growing role in supporting VET in “new” Länder • Participation in international tests
Philanthropy and Corporate Philanthropy		
<ul style="list-style-type: none"> • Restarted foundation sector • No role in K-12 edu/some role in higher edu 	<ul style="list-style-type: none"> • More foundations founded • Corporate too • Complementary role to state • New foundation types develop- more liberal 	<ul style="list-style-type: none"> • Foundations boom starts in 1990s • Some corporate foundations with K-12 education/schools • Corporate foundations grow/CSR starts

TABLE 4.2: SUMMARY UNITED STATES

Late 1940s-1950s	1960s-1970s	1980s-1990s
Business/Industry		
<ul style="list-style-type: none"> • Little to no provision of VET • Preference for “White Collar” supervisors • Participation in Boards of Education declines • Growth in CP and its purposes- becomes more professionalized • Mainly CP in higher education (to avoid Big Government), few K-12 initiatives 	<ul style="list-style-type: none"> • Little to no provision of VET • Limited management of schools through results-based contracts but ended because of cheating scandal • CP grew tremendously • Start of CSR- business expected to do more for society • Started political advocacy towards reduced government spending and taxes (including edu) 	<ul style="list-style-type: none"> • Limited provision of VET through work-based learning partnerships • Some advocated for more practical VET • Policy influencer local, state, and federal education after <i>Nation at Risk</i> • For standards-based reforms/more edu spending • School-Business partnerships/Model schools • CP- doubled and long-term commitment to K-12 edu
Education System Themes		
<ul style="list-style-type: none"> • Expanded comprehensive high school model • VET treated as separate in policy and funding decisions • Sputnik excellence initiatives • Creation of NSF- focused on improving science education for academically strong students • Minimal role of federal government in K-12 edu • <i>Brown</i> ruling against racially segregated schools 	<ul style="list-style-type: none"> • Enforcing equal education after <i>Brown</i> decision • Issuing new Special education requirements • Vocational Edu Act of 1963- VET mixed in comprehensive high schools, VET for Special Ed, other student groups • Work-based VET encouraged but limited funds • <i>War on Poverty</i>- funds for schools serving poor students -ESEA • Growing federal role in education, mainly in funding new laws 	<ul style="list-style-type: none"> • State standards and assessments adopted for ESEA funding • Federal role becoming more prescriptive • Promotion of Model Schools- reformed schools with new designs and plans • Push for national standards but ended up with state standards • Start to emphasize academic skills in VET • STWOA- work-based learning but did not reauthorize
Corporate Philanthropy		
<ul style="list-style-type: none"> • More limited role in edu after WWII and growth of edu for all and federal gov 	<ul style="list-style-type: none"> • Continued support of curricular reforms • Creation of national testing and policy orgs 	<ul style="list-style-type: none"> • Supported reforms, research, and advocacy but also school districts directly

<ul style="list-style-type: none"> • Supported curricular changes and improvements to teacher workforce • Increased regulations on NPOs/foundation 	<ul style="list-style-type: none"> • Ford shift to local advocacy results in attention on role of foundations • Tax Reform Act 1969-tighter regulation of foundations 	<ul style="list-style-type: none"> • Annenberg Challenge-seen as ineffective • “New” funders with alternative approaches/advocacy enter the field
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Chapter 5: The 2000s

Overview

This chapter is focused on providing context regarding corporate involvement in K-12 education in Germany and the U.S. starting with the year 2000. This content is critical to understanding the conditions surrounding the decisions of companies and their foundations engaged in education, but also includes many unanswered questions, which I address in the interviews.

Germany

As mentioned in the historical chapter, the 1990s saw the start of a decline in the number of companies offering dual vocational training. The early 2000s continued this trend and led to major policy discussions about how to best increase the number of training spots available. At the time, the government led by an SPD-Green coalition, advocated for a financial transfer policy where firms that did not train enough apprentices would have to pay a levy and firms that trained enough or more, would get financial rewards. Industry associations and chambers protested the concept as a way to bring dual training under state control and as a way for unions to have ever more influence on their training policies. Just as industry had always argued, the lack of enough training spots was for industry to solve, not the government. Some of the unions were also against this proposal because of what they saw as interrupting their current models in certain industries. Meanwhile the FDP argued that the policy was unconstitutional and the CDU argued that it would bring the dual training system to its end and lead to too much state involvement in vocational training (Busemeyer, 2009, pp. 151-155; Thelen, 2004, p. 266).

An effort to address some of the concerns led to the SPD-led government coming together with leaders of industry associations to propose an *Ausbildungspakt* (Training Pact).⁴⁶ This pact agreed to by industry and the government in 2004 included the creation of 30,000 new training spots each year, and 25,000 internship opportunities as a way to better prepare students for dual vocational training. The unions, who were left out of the pact, expressed disappointment however, that the

46 Officially known as: Nationalen Pakt für Ausbildung und Fachkräftenachwuchs in Deutschland

30,000 new training spots were not additional training spots and therefore not much of a stretch for industry. They were also concerned that it was a “pact” and not a law meaning that industry would not have a real penalty if this goal was not met. The internship placements for struggling youth however were new but were to be paid for by the state. In end effect, industry was able to get the proposal for vocational training levies off the table without having to give up much in return (Busemeyer, 2009, pp. 155-157; 2011, pp. 12-15). It should also be noted that the internship programs have been quite successful in helping youth transition into the dual vocational training system. Later editions of the pact and its successor did include additional actors including the unions and expanded the goals to include addressing demographic and integration issues (Busemeyer, 2015).

During this time, industry was also successful, after decades of trying, in opening more opportunities for two-year apprenticeships as a way to differentiate for the varying levels of skill in some jobs and to reduce the amount of training they needed to provide. As discussed in the section on the 1980s, industry proposed shortened apprenticeships but was never able to get enough support from the CDU-FDP governing coalition at the time. This time around however an SPD Minister saw the benefits of two-year dual vocational training because he saw this as a way to solve the problem of not having enough training spots. He also saw this as an opportunity to provide training spots for the applicants that were disadvantaged or deemed unprepared for a full dual vocational training program. This decision was made despite the fact that the unions and longtime SPD partners were adamantly against the two-year model. They feared it would weaken their collective bargaining processes. In addition, many of the smaller craft firms were also against this change because for them, the third year in training when an apprentice is most productive, is critical to their financial bottom line (Busemeyer, 2009, pp.160-163 ; 2011, pp. 9-15). By 2011, about nine percent of all dual vocational training contracts were for two-year dual vocational training spots, up from about four percent in 2002 (BIBB, 2013, p. 152).

Both the development to offer pre-vocational training internships and the development to allow for more two-year dual vocational paths point to some issues in the dual vocational training system’s ability to fulfill the demand for training spots.

This is best evidenced by the growth in the transition system;⁴⁷ which includes multiple different experiences to better prepare applicants for vocational training but often results in students spending years busying themselves with activities that do not give them any vocational or school credential (Baethge, Solga, & Wieck, 2007, pp. 21-22; Hoeckel & Schwartz, 2010, pp. 20-22). Where as most people think of the traditional German vocational model as finishing secondary school and then continuing directly to a dual vocational training program, Solga (2009), highlights that increasingly this is no longer the case. As part of a stopgap measure to balance the supply of actual training spots with the demand for these spots, the transition system grew significantly between 1995 and 2006, from about 32% of all new entrants to the vocational system to almost 40%. It also showed that despite all the talk about the demographic changes and not having enough future workers, there were actually more people in the vocational system in 2006 than in 1995. This is due to the growth in both school-based vocational education and in the growth of the transition system (pp. 8-15).

Although there had been a lot of conflict surrounding the levy proposal, the proposal to reform the Vocational Training Act in 2005 passed through the Bundestag with limited resistance (Busemeyer, 2011, p.15) It was amended to allow for:

- Flexibility within the training to allow additional courses, part-time options and a clarification of minimum requirements but also the provision for including additional qualifications
- The ability to transfer credits from school-based vocational education into dual training programs
- Differentiated levels of dual vocational training
- The possibility to do portions of the vocational training abroad
- A modernization of the exam process and to allow the Chamber exam to be given to people who did not do the initial vocational training (all within state-level discretion) (BIBB, 2005)

Again many of these reforms seem to be aimed at decreasing the pressure on the dual vocational training system by allowing other paths to get to the credentials that did not require an increase in the number of training spots. Industry was against allowing

47 For more on the transition system, see the historical chapter

school-based vocational education participants to be eligible to take the chamber exams and then be seen as an equal credential. They saw this as threatening to their training autonomy and again saw it as a heavy hand of the state. In response, these elements were paired down a bit and scheduled to end in 2011 so that this was seen as a temporary way to make up for a lack of training positions (Busemeyer, 2011, pp. 15-17). It is obvious, that just as in the past, industry is heavily involved in shaping the vocational education agenda.

Interestingly, at the same time there were so many attempts to place would-be apprentices, several industry and chamber leaders complained they could not find enough apprentices. They worried about the coming dearth of German youth and pointed to the many dual vocational training positions that went unfilled. How could this possibly be if there were more than half-a-million people in the transition system trying to advance into the dual vocational system? One answer for this is that when the supply of training spots is calculated and compared to the number of applicants, all of the applicants who are working or involved in the transition system are not counted. They are considered taken care of regardless of the fact that most of them should be counted as not yet placed. Another reason for this discrepancy is the expectations many companies have of dual vocational trainees coming in. Many of them expect them to come in with a fairly high level of skills and competencies or as some see it, ready to hit the ground running from day one and needing less actual training (Solga, 2009, pp. 8-15).

Another way to account for this discrepancy is to look at the increasing cognitive requirements for entry to dual vocational education. Although there are technically no school certificate requirements for dual vocational education training, these programs can be grouped into subgroups by levels of education. By 2010 the upper segment of dual vocational training included more than 61 percent of students with the entrance requirements necessary to go to higher education. Of apprentices in careers at the upper- and lower-middle levels 26 and 11 percent respectively also had these high credentials. On the reverse end, all but the lowest segment of dual vocational training had very low percentages of students with the Hauptschule (lowest secondary school certificate). This points to a major problem for industry in playing its role of integrating lower achievers into the labor market (Baethge & Wolter, 2015, pp. 101-

103). This also helps to explain the paradox of having a graying population and as a result fewer available workers but at the same time, having a sizable proportion of unemployed people who cannot find work. Companies are not just demanding workers, they are demanding ever more qualified workers (Helmrich & Zika, 2014, p. 196).

This emphasis on apprentices arriving with high levels of competencies continues with a theme discussed in the 1990s section of the historical chapter- namely, the shift in the economy from a heavily industrial economy to a service and knowledge economy. As Baethge (2003) points out, this shift results in a higher demand for people with more broad-based knowledge and skills and the ability to be flexible in their placement throughout the company and the ability to be innovative. Or in other words, the new economy favors those skills and competencies most associated with higher education, not the dual vocational training system, which focuses on specific work skills based on the demands of the employers. His 2006 article further argues that this is tough shift in a country where there has always been a stark, seemingly insurmountable divide between vocational and academic preparation. With decreasing industrial production and increasing information and service sectors, the employer demand grew for employees with analytical, communication, and problem-solving abilities – or the abilities that a higher-level academic preparation provides (pp. 24-27).

The shift from industry-related production to the service and knowledge sectors has an even larger impact on the dual vocational training model because unlike the former, the latter relies much less on this type of training. Also many of the industrial firms that did once offer dual vocational training, have stopped because the costs were deemed to high and the investment in training was considered risky (Baethge & Wolter, 2015, pp. 105-106). The combination of these two factors has resulted in the percent of firms offering dual vocational training to decline even further from 23.6 percent in 1999 to 21,3 percent in 2012 (continuing a trend already seen in the 1990s). Similarly, the percent of employees that are apprentices in a company also dropped from 6.3 to 5.6 percent in the same time period (Autorengruppe Bildungsberichterstattung, 2014, p. 276). With a decreasing percent of firms involved and a decreasing percent of apprentices, the corporate governance structure of the

dual vocational training system in starting to wane (Baethge & Wolter, 2015, pp.106-108).

It is important to point out here that the types of firms that were leaving the dual vocational training system were overwhelmingly small and medium-sized enterprises. This leaves the larger companies with much more power in negotiations with the state and other actors when it comes to vocational training. The state not wanting to lose any more apprenticeship positions often bows to their needs and agrees to be more flexible in rules and regulations. This has resulted in some companies, especially the larger ones in becoming more segmentalist in their training approach. Segmentalist meaning that they are providing training that is more specific to the needs of their company and pushing for the collectively decided standards of the vocational profile to meet their needs. Often smaller firms cannot meet these requirements and stop providing training. The result is a dual vocational system that is lopsided by the power of larger companies; which sometimes comes at the expense of the participation of smaller companies. This is also abetted by the ongoing weakening of central collective bargaining and a decrease in union membership. This has resulted in fewer available apprenticeships but for larger companies, this has meant a higher quality pool of apprentices to select from (Thelen & Busemeyer, 2012, pp. 75-84).

In addition to the changes in the economy and to the balance of power in favor of larger companies, the preferences of students finishing high school also changed drastically. For the first time ever, in 2013, the percent of students going on to higher education institutions exceeded the percent of students going to vocational education programs (Autorengruppe Bildungsberichterstattung, 2014, pp. 99-100). When asked if they wanted to go to higher education or do an apprenticeship, just 47 percent of students completing high school in 2012 said they wanted to go on to a dual vocational training (BIBB, 2013, p. 75). Part of what is driving this are changes in the economy described above but part of it is also a cultural shift that values higher education above all else and the perception that higher education leads to better career chances, higher income, and societal prestige (Baethge & Wolter, 2015, pp. 104). These changes in preference are also reflected in the high percent of students going on to and completing higher education. In 2000, just 18 percent of young Germans received an academically focused upper-postsecondary degree (tertiary type A)

compared to an expected 30 percent in 2012 and at the same time, the income gap between those with higher education and those without has grown (OECD, 2014, p. 4).

Companies and higher education institutions have also reacted to the major changes in the economy and the preferences of students. The desire among companies to have employees with increasingly higher and broader levels of knowledge along with increasing demand from younger generation of Germans for a higher education degree is fueling the creation of dual study (duales Studium) programs, where upon completion of an Abitur or a comparable qualification, apprentices work in the firm and attend a higher-education institution in pursuit of a bachelors degree. There are basically two forms of dual study. There are those that are aligned to a dual vocational training program and include all of the rules and regulations of the traditional dual vocational training but at the end the trainee receives both a bachelor's degree and a certificate from the respective chamber. Then there are those that are considered near to practice and are not subject to all of the rules and regulations of the dual vocational training system and the trainee receives just the bachelor's degree at the end. In both cases there is a work- and higher education-based component. The number of these programs Germany-wide has tripled in Germany going from just over 500 different programs in 2004 to over 1500 in 2014 while the number of students enrolled in these programs has more than doubled in the same amount of time (BIBB, 2014). The programs allow employers to attract high-achievers early on and to avoid the costly problem of providing them a dual vocational training only to have them leave for a higher education institution at the end (Jacob & Solga, 2015, p. 168). These types of dual study programs tend to be most prevalent among the larger companies who can afford to provide them, further giving them an advantage in recruiting and training students with higher skill academic abilities.

Other initiatives aimed at satisfying the demand for higher education opportunities include converting vocational schools to universities of applied sciences. Both of the options above however do not always allow for a smooth entrance to a traditional university for masters level classes. Another option includes double qualification certification; which provides completers of a dual vocational training program with a higher education entrance certificate that allows them entry to any university, not just the applied science universities. Although this is an option in both Switzerland and

Austria companies in Germany were against such an option because a large proportion of apprentices already have a general higher education certificate meaning that they do not need to make it more attractive to them. Instead, in 2009 an Innovation Circle on Vocational Education, which was appointed by the government and consisted of business leaders, unions, industry associations, chambers, and representatives from vocational schools and various levels of government agreed on the consideration of occupational competencies for entry to higher education. This led to standardized criteria for permitting vocationally trained applicants to enter the general higher education system (Nikolai & Ebner, 2012). A clear trend here are the initiatives to mix higher education opportunities with vocational training opportunities as a way to remain attractive to potential apprentices and for firms who increasingly value a broader set of knowledge and competencies.

While the vocational training system was experiencing some pressures due to a changing economy and an ever growing share of students deciding to seek higher education, the general education system was experiencing a shock or as the Germans call it: the PISA Shock. In December of 2001 when the results of PISA revealed that Germany's secondary students were below the OECD average in reading, math and science. The results further showed that Germany had the largest discrepancy between students with the highest and lowest levels of socioeconomic status and that 22 percent of all students were reading below a basic level of proficiency (Baumert et al., 2001, pp. 102, 107, 173, 181, 229, 230). For a country that prided itself on its education system and considered itself to be a world leader and a place for social mobility, a country that had not enacted any major education reforms since the 1970s, this was an earth shattering moment and one that led to a constant political discussion about how to improve and ultimately, to many reforms (Martens & Leibfried, 2007; Martens & Niemann, 2013; Niemann, 2010, pp. 63-65; OECD, 2011).

The PISA Storm led to a media storm and with it, public outrage about the state of German education. In no other country was PISA so widely covered by the media as it was in Germany (Olano et al., 2010, pp. 10,17). It also led to new actor constellations because of the way the results were associated with future economic outcomes and human capital prospects; thereby allowing many interest groups and foundations to add their education agendas to the policy discussion (Niemann, 2010,

pp. 85). For the first time in the history of the Federal Republic, education was a major theme in the Bundestag (parliament) elections (Hepp, 2011, p. 126).

The early years of the 2000s following the PISA results were full of education reform efforts at every level. For example, the Standing Conference of the Ministers of Education and Cultural Affairs (KMK) developed performance standards in 2003/2004 which all 16 Länder adopted (Köller, 2011) and performance assessments in grades 3 and 8 were introduced. Germany has also increased its attention to the provision and quality of early childhood education, increased the length of the school day in many schools, and changed the structure⁴⁸ of its high schools to provide more equal opportunities for *At-Risk* students. Additional reforms include a focus on German language acquisition for young children with migrant backgrounds, increased autonomy at the school level, and a focus on the needs of struggling students during pre-service teacher training (Köller, 2009; OECD, 2011, pp. 208-213). Many of the reforms were part of a broader international, neoliberal trend in education to move from input- to output-oriented measures⁴⁹ for evaluating the performance of school systems. The output-oriented systems focus on how to be most efficient or effective, have top-down management styles, include many state, civil society, and other actors, and focus on indicators and comparative measures (Höhne & Schreck, 2009, pp. 30-34).

Critical here were also the structural changes to high schools made after the release of the PISA report. Long a topic of debate, the structure of the secondary schools had undergone many reform efforts in the 1970s; however the tripartite system of Hauptschule, Realschule, and Gymnasium had largely remained in tack. The reunification resurfaced some of these debates as the former East German states all opted for two-tiered systems which led to a vocational or an academic track (Edelstein & Nikolai, 2013). The PISA results showed a large difference in student performance between the different school types and that students in the Hauptschule were

48 The history of structural change could in secondary schools could fill a book of its own. For a little more information, see earlier section on 1990s about the structural changes in high schools in Germany.

49 The former included measures such as: the number of students per teacher, number of books, or the number of classes offered. The output-oriented systems were focused on the outcomes of the system such as: test scores, percent of graduates, or growth in higher-level course taking.

alarmingly below the basic levels in literacy, science and math. For example, more than 60 percent of Hauptschule students scored below level II in literacy, meaning their reading abilities would restrain their abilities to be effective and productive in life (Baumert et al., 2001, pp. 123,181, 239; OECD, 2001, p. 52). It was after PISA that reforms to the school structure really emerged. By 2013, of the 16 German states, 11 had eliminated the Hauptschule and moved to a two-tier model and an additional four have made changes to their laws to allow such modifications to happen (Kennedy-Salchow & Nikolai, 2014).

While Gymnasium had been extremely selective in 1955 with 16 percent of students attending, by 1995 that changed drastically with 31 percent of students attending (Nikolai & West, 2013, pp. 61-62) and by 2014, 34 percent of students attend Gymnasium⁵⁰ (Malecki, 2016, p. 13). Part of this is due to the decreasing size of the school-aged population. In other words, although the percent of graduates leaving with an Abitur (graduation degree typically after Gymnasium) increased greatly, the absolute number did not because of shrinking cohort sizes (Jacob & Solga, 2015, p. 163). With this in mind, it is hardly surprising that the other end of the secondary school spectrum, the Hauptschule has dwindled from serving 74 percent of students in 1955 year to 24 percent of students in 1995 year (Nikolai & West, 2013, p. 60). Today, 12 percent of students attend a Hauptschule (Malecki, 2016, p. 13).

It is quite difficult to make a direct correlation between specific education reforms and performance but what can be said is that Germany's performance on PISA has improved remarkably since the 2001 shock that set off the many reforms discussed above. In PISA 2015, Germany was above the OECD average in reading, mathematics and science and is considered to be one of the big improvers among OECD countries. Still concerning but improving is Germany's performance gap between students from higher and lower socioeconomic backgrounds in science for example where Germany no longer has the largest gap but still has a gap larger than the OECD average (OECD, 2016, pp. 5, 8, 9). This represents the ongoing challenges

50 Note: these statistics do not include or reflect the reforms that have been made that created additional forms of school, which also offer paths for students wishing to go to university such as the integrated secondary schools- now about 16 percent of students.

of inequality in education opportunity and outcomes but also opens the question of how companies and their foundations have positioned themselves to address them.

Among the main new actors to enter the general education policy debates after PISA were industry groups and unions. Employer associations and the chambers used the PISA results as a way to put pressure on policymakers to make substantial changes to Germany's education system. For example, the Confederation of German Employers' Associations (Bundesvereinigung der Deutschen Arbeitgeberverbände-BDA) was quite direct in calling on policymakers not to create working committees that would take too much time but to enact policy changes. They argued that their employers were in desperate need of workers with a solid foundational level of education. BDA called for the education system to be more focused on and driven by performance measures overall. It also advocated for reforms such as education standards, improving the teacher preparation processes, early education initiatives, regular testing, more school autonomy, more supports for immigrant children and children with special needs and to lengthen the school day. Interestingly one of the largest unions in Germany, the German Trade Union Confederations (Deutsche Gewerkschaftsbund- DGB) also supported most of these reform efforts and even developed an education reform concept paper with the BDA that promoted these very reforms (Raidt, 2010, pp. 96-98). These positions with a focus on improving educational chances for disadvantaged students, using more neoliberal market-oriented mechanisms aimed at efficiency and competition, and decentralization were nearly identical to those taken by many policymakers at the time. Industry partners were considered especially relevant because of their expertise in modern leadership and management concepts. This new role for industry associations was not just evident at the national level but also at the state level. To further drive their messages and positions new nonprofit and advocacy organizations such as *Aktionsrat Bildung* or the *Initiative Neue Soziale Marktwirtschaft* were heavily supported by industry to write position papers, bring in experts, and to bring more media attention to their suggested reforms (Hepp, 2011, pp. 86-90).

Nearly all of the main industry associations and chambers became active in general education issues after the PISA shock but to differing degrees. In an analysis of the publications of major industry groups and unions in the years 2001-2003, Kreft

(2006), found that the industry groups had far more publications and statements about school level education (Schule) than about vocational education. While some industry groups such as BDA and the German Confederation of Skilled Crafts (Zentralverband des Deutschen Handwerks- ZDH) focused on general education at the K-12 level or even on early education, others, such as the DIHK were focused more on higher education. The publications of the unions; however, were more evenly split between school, higher education, and vocational education. The analysis also went further to look across time and found that in 1980 and 1990 there was virtually no mention of school policy among the publications of these groups earlier (pp. 158-164, 166-167).

As many of the industry groups pointed out, there were clear signs from many of their member companies, but especially those that offered dual vocational training, that far too many trainees were unprepared for their training. PISA's comparison of Germany to other countries; however, made this obvious to everyone else. The two major concerns for the industry associations evident in their publications following the PISA shock were the overall quality and competence levels of school graduates and the large socio-economic discrepancies, which left some students severely disadvantaged. The unions also had the same major concerns but with more of a focus on giving more people better educational chances. For industry, a leading reason they cited for the need to improve the quality of education was a need to secure more highly skilled workers, especially with the demographic changes that would result from a declining youth population. (Kreft, 2006, pp. 165-166). As industry increasingly cooperated with the state in many areas but especially education, industry actors' involvement in education politics became the norm. This included consulting firms, companies themselves and foundations (Höhne & Schreck, 2009, pp. 11, 120-121). While these are real concerns, most are real concerns for all of society, this begs the question of why industry associations and unions were becoming involved in general education.

The answer lies in the continuing decline in the dual vocational training system. While most of the industry groups and unions advocate for this system, many of the member companies no longer saw it as having a cost-benefit scenario that worked for them. In addition, many of the companies were unable to find trainees with the skills and competencies they needed. This resulted in the firms either deciding not to offer

dual vocational training or offering it but having to offer substantial supports, which also drove up the costs of training. Neither one of these options is ideal in maintaining or even increasing the dual vocational system. To address this, both unions and industry associations started a large push on improving school level education to improve the quality of the trainees (Hepp, 2011, pp. 86-90; Kreft, 2006, pp. 283-286).

Meanwhile from a philanthropic perspective, Germany was experiencing a “Stiftungsboom” (foundation boom). Starting in the 1990s, the number of foundations founded over a five-year time span went from about roughly 500 to more than 1,500 between the years 1996 and 2000, and to more than 2000 new foundations between the years 2001 and 2005 (Bundesverband Deutscher Stiftungen, 2007). Put another way, of the roughly 19,000 foundations in Germany, 71 percent of them were founded since 1990 or 54 percent since 2000 (Anheier et al., 2017, p. 1). Among all foundations, the percent investing in education as a main priority remained steady at about 15% and as the second largest priority area among foundations (Bundesverband Deutscher Stiftungen, 2014b) but 37 percent of foundations support education (Anheier et al., 2017, pp. 17-18). Since the end of the 1990s, foundations were active in education by offering multiple types of resources such as expert advice, money, and through their own projects (Höhne, 2015, p. 30). With the large growth in foundations in the years following the PISA shock, there were plenty of new philanthropic actors in the education field.

Among the new actors in the education field were many corporate philanthropic actors. Of all of the corporate related foundations,⁵¹ 37% were founded between 1996 and 2005 and about 17 percent of them had a focus on education (Junck, 2007, pp. 36-37, 42). Some of the growth in foundations but also specifically in corporate foundations may be attributed to changes in German law in 2000 and 2007 that provided additional tax advantages and made it easier to start a foundation (Adloff, 2010, p. 405; Mecking, 2010, p. 380).

⁵¹ Note: this study refers to corporate related foundations; which also include foundations founded independently of a corporation and other foundation forms not allowed in the U.S. so not all are corporate foundations by definition.

Of all corporate related foundations, about 23 percent of them are CSR-style corporate foundations (Hirsch et al., 2016, p. 26) and several of them who became active in education were founded between 2000 and 2010 such as the Telekom Foundation, the Vodafone Foundation, and the Siemens Foundation. Some of these foundations, such as the Telekom foundation, founded in 2003 with 100 million euros, far exceeded the soft limit of 50 million euros for the starting of a corporate foundation (Mecking, 2010, p. 379).

Unlike the traditional German foundation sector, which is considered to be corporatist in nature, with foundations operating as providers of services that are funded largely by the state, many of the new corporate foundations would be considered a part of a growing liberal sector of foundations. These foundations are clear about their separation from the state, see themselves as alternatives to the mainstream, and form a system that parallels government. Liberal foundations often take on the roles of innovation and social policy change (Anheier & Daly, 2006b, see also table on p. 57, pp. 17-20). A study of German foundations showed a bifurcated foundation sector with a minority of foundations that have a liberal model of action (Adloff et al., 2006, pp. 172-179). These liberal style foundations started to become more professionalized in the 1990s and are increasingly interested in the American ideas of strategic philanthropy such as conditional giving, inter-organizational reciprocity, and the conversion to venture capital like giving (Adloff, 2010, pp. 401-402, 413; see also: Mair & Hehenberger, 2014).

The degree to which companies are actually strategic in their philanthropic giving and how they engage in social issues is related to their size. A study showed that 95,6 percent of all companies are active in some form of societal engagement, of them 91 percent participate in some form of corporate giving including direct giving, donating goods, participating in fundraising activities. Just four percent had a foundation. The study further found that most corporate giving in Germany was reactionary but that the larger the company, the more likely they were to be strategic in their giving. For example, 26 percent of companies with 500 or more employees measured or attempted to measure the impact of their social engagements, compared to about nine percent for companies with 50-499 employees. The larger companies were also more likely to have an action plan for their engagement and be intentional in their

participation. The authors remarked that there was a dividing line in the degree of corporate citizenship exhibited between big companies and small or medium-sized companies. Large companies were found to integrate their social commitments into their overall identity and about 95 percent saw it as their responsibility to take on social challenges. About half of these companies saw the social investments as critical to the success of the company. These aspects are also characteristic of the international corporate citizenship movement and may demonstrate that larger companies in Germany are starting to fold these characteristics into their overall identity and are using them to integrate traditional aspects such as corporate philanthropy into their overall business strategy (Backhaus-Maul & Braun, 2010, pp. 312-317; Braun, 2010, pp. 8-9).

While some may point to the founding of new corporate foundations in Germany as evidence of increased interest in corporate citizenship, some scholars point to this as being more of a shift in the way industry interacts with the rest of German society. Industry has long been engaged in society in ways that are defined by the state, with the dual vocational training as an excellent example of this role. Although they cannot simply pull out of these arrangements, they also do not believe they can depend on them to secure social and human capital without also being active in other ways such as education more generally (Backhaus-Maul et al., 2010, pp. 18-20). As this collectivist system of training and of many other areas of business recedes (see for example: Streeck, 2009), corporations, looking to maintain their influence and contacts, are shifting towards more corporate citizenship endeavors, including corporate foundations and giving but also lobbying and public relations (Speth, 2010, pp. 343-345). Höhne and Schreck (2009) refer to this as a new form of German collectivism with elites from large companies, top politicians, leaders of some unions, and foundations come together around a specific issue and decide upon the direction but usually outside of the public eye and in ways that are informal and difficult to observe (p. 126).

In a study of the activities of corporate-related foundations funding science initiatives, 43 percent were active in a form of policy advocacy. Through many events and publications, they influence policymakers but corporate foundations also work together on specific topics for even stronger political agenda setting. An example of

this is the support of the Telekom, Siemens, Hertie, and Jacobs foundations for the Nationales MINT Forum (Hirsch et al., 2016, pp. 64-74) which will be discussed in length further in the findings.

For some foundations, creating educational networks of multiple foundations, school organizations, and school-related nonprofits serves as a way to increase their legitimacy as actors in the education field. Often the foundations do not actually contribute money to these endeavors but instead use these opportunities as a way shape public awareness of their educational agenda by influencing the norms, institutions, and discourses (Kolleck, 2015, p. 9). In a similar light, Gerber (2006) argues that when there are large problems in a social area such as education, no single actor could solve these issues and where an innovative solution is necessary, foundations can play a key role in bringing together the multiple actors from politics, science, practice, and nonprofits with state actors around potential solutions. In her case study of the Freudenberg Foundation, a corporate-related foundation (and her employer), she found that a key characteristic was its ability to act as a “connection agent” (Verbindungsagentur) (pp. 38, 42-43).

The Learning Locally (Lernen vor Ort) initiative started in 2009 is an example of foundations playing this connective role. The Federal Ministry of Education and Research (BMBF) came together with 46 national-level foundations, including some corporate foundations and many more local-level foundations to incentivize local communities to create and maintain sustainable education management systems that would lead to life long learning. What is interesting to note is that although the foundations likely also gave money to these initiatives, what they are highlighted for are their local networks and their expertise and experiences in education innovation. The reasons listed for starting this large public-private partnership included education concerns such as the percent of children with low levels of German literacy or the disparities in being prepared for university between students coming from academic and nonacademic families. There were also several workforce-related reasons listed, including a projection of a shortage of engineers and scientists and the aging population, which would result in a demand for workers to replace them (BMBF, 2009).

It is important to note that the Lernen vor Ort initiative was initiated at the national level but implemented at the regional or local level, not at the state (Bundesland) level. This is an important detail because it is part of a trend noted in by (Höhne & Schreck, 2009), which emphasizes the use of regional elite networks in a new way of organizing the governance of education. In this regionalization model, elites from the schools, local employers, local government, area foundations and other nonprofits work together in networks to support agreed upon education initiatives. While this used to happen more at the state and national levels, the new economy which is not as geographically or resource dependent, has regions competing to maintain their economic edge. The regional cooperation and governance makes it easier for more private actor involvement because they are already more active at that level and can easily bring in their influence (pp. 111-118). My research however, focuses more on the national level, where some of the ideas are initiated.

Summary and Questions Germany Early 2000s

In the early 2000s industry was active in vocational education just as they traditionally have been; however, shifts in the demographic, economic, and education landscapes resulted in a shift in their education position. Whereas well into the 1980s, industry could be relied upon to train excess youth for apprenticeships, by the early 2000s this was clearly not the case. With even more firms deciding not to offer training or offering less apprenticeships and with the economy shifting to more of a knowledge and service economy that did not value this type of training as much, it was no longer possible.

In attempting to offer more apprenticeship places, industry associations worked with the government to create more work-based pre-apprenticeship opportunities and to open more apprenticeship places. The lack of apprenticeships also opened the door for industry to accomplish some of its longstanding policy goals such as more flexibility in training and two-year dual vocational training options. With all of this, it almost seems surprising that companies also routinely complained that they could not find enough apprentices. This however is reflective of the shift in the economy that led to more service sector jobs that value broad knowledge and higher levels of education. Did these changes affect the way corporations invested in K-12 education overall? Did corporations become more active in education in other ways as a result?

While larger companies did not decrease the number of dual vocational placements they had, how did they adjust to the new demands in the education field?

Industry also had concerns about the decline in the size of the youth population and an increase in the desire for higher education among them has resulted in a higher proportion of students going on to university instead of dual vocational training. While industry responded by offering new programs such as more dual study opportunities, they have also become quite active in general education after the results of PISA were made public and the resulting “shock.”

Citing the difficulties of their member companies in finding trainees that were well prepared for dual vocational training, the industry associations jumped on the opportunity PISA opened for them to be more active in education policy. PISA’s comparison of Germany to other countries helped them to be listened to in a way they were not before about overall competence levels but also about low performance of students from immigrant and low-SES families. For the industry associations, becoming active in general education, was seen as a way to save the dwindling dual vocational training system. It was seen as a way to ensure employers would have more qualified applicants and would need to spend less on supporting trainees. This was a substantial drift for the industry groups who had usually not weighed in much in general education initiatives but how did companies respond to this challenge? Did they become more active in education too? Did they use philanthropy to do so? How is this related to their competencies as a company?

At the same time, the foundation boom of the early 2000s and the increasing participation in corporate citizenship and corporate philanthropy further opened the door for companies to become active in general education. Especially the larger companies became more active in strategic philanthropy with many of them having a main focus on education. But what did that mean for them to be more strategic? Although these bigger companies have on average not declined in the number of apprenticeship places they offer, are they concerned about the long-term ability of the dual vocational training system to provide the human capital they need? If so are they doing anything on the philanthropic side to address these concerns? Where do MINT

education initiatives fit into this equation? Are they seen as potential ways to get more trainees? To better prepare students for higher education?

United States

In January of 2002, Republican President George W. Bush signed the No Child Left Behind (NCLB) act into law. Although NCLB was actually the reauthorization of the ESEA, which originated from President Johnson's "War on Poverty," it received a lot of attention for the increased role of the federal government in education and for the testing, reporting and accountability provisions. NCLB built on the ESEA reauthorization of 1994, which required states to have academic standards and annual tests in reading and math in elementary and middle school levels. NCLB went further by requiring: annual tests in reading and math for every grade level between grades three and eight, and once in high school, public reporting of test results for each grade and subject tested, which was to be disaggregated by race/ethnicity, students receiving free and reduced lunch, English Language Learners, and for special education students. Added to these requirements was the need for schools and districts to meet Adequate Yearly Progress (AYP) targets on assessments with the goal that all students be proficient by the year 2014. Failure to meet these moving targets resulted in increasing consequences for schools or districts and could result in school closures or other forms of "school restructuring." It also contained provisions for the privatization of school support services and other school choice options (Mehta, 2013, pp. 232-233; Ravitch, 2013, p.11).

Several business groups, which had long been active in education but supported states' rights in K-12 education, supported this increase in the role of the federal government. They favored specific provisions such as standards, tests, and accountability because of their growing concern about the preparedness of the workforce and a belief that the states were not doing enough on their own to improve educational outcomes. They were joined by civil rights groups who had long been against some of these provisions because they feared that they would have adverse effects on students of color and those from disadvantaged families. After years of fighting for increased education spending, actually getting large increases, and still not seeing improvements in outcomes, the civil rights groups were also open for

trying new reforms. Together interest groups representing these constituents along with new think tanks became a formidable political force in favor of NCLB (DeBray-Pelot & McGuinn, 2009, pp. 23-27; Mehta, 2013, pp. 233-234).

NCLB is often cited for its bipartisan support in the House and the Senate because of its ability to address Republican issues such as standards, school choice, and privatization initiatives while also addressing the concerns of the Democrats such as more focus on poor and minority students and the continuation of federal funds in K-12 education. However, it was not long before NCLB was seen as a problem rather than a solution by almost all people involved. Because of its heavy-handed focus on standards and testing, it was quickly seen as driving education to the bottom as states lowered standards and expectations in an effort to meet their AYP requirement and to avoid the political fall out of a failing education system. Republicans came to see it as an over-reach of the federal government, while Democrats saw it as punishing to schools and districts because it focused more on the measurement of school success than on real ways to fix the schools (Ravitch, 2013, pp. 12-14; Schneider, 2011, pp. 33-35).

A review of the positions of business organizations during the reauthorization of NCLB in 2007 however, does not reveal major concerns about the law among business groups and top corporations, in fact, quite the contrary. For example, the Business Roundtable came together with the U.S. Chamber of Commerce and several member companies to form the Business Coalition for Student Achievement to advocate for the reauthorization of NCLB. They advocated for the strengthening of several foundational elements of the law and opposed any changes to the accountability provisions, which several educators and unions cited as leading to a narrowing of the curriculum. In a letter to all members of the House of Representatives, the BSCA stated “we strongly urge you to oppose any legislative proposals, including those that may come up through the appropriations process, that would weaken accountability for improving student achievement under the No Child Left Behind Act (NCLB)” (Business Coalition for Student Achievement, 2007; Business Roundtable, 2007). Individually business organizations also released statements and testified before Congressional members with similar messages of strengthening NCLB and being sure to include accountability measures as a way to

improve student achievement; which in the long run is important for human capital purposes for business (Business Wire, 2007).

Ultimately NCLB was not reauthorized in 2007 but what is interesting to note is that among business leaders' statements and testimonies there is not a focus on improving STEM education and virtually no mention of being disappointed with the law. It appears however that the business community was active in this endeavor in other ways because in 2005, several leaders of large U.S. corporations were part of the Committee on Prospering in the Global Economy in the 21st Century that released a report titled "Rising Above the Gathering Storm." This committee was asked by members of Congress who served on the Energy and Natural Resources Committee to develop 10 recommendations to increase America's science and technology enterprise in order to remain competitive. The committee's highest priority recommendation in their report was to improve K-12 education overall but more specifically in the STEM subject areas and especially for poor and minority students (Committee on Prospering in the Global Economy of the 21st Century, 2007, pp. 5-7, 112-135). Interestingly many of the recommendations included in the report such as improving teacher quality of science and math were prominent in the America Competes Act, which was signed into law by President Bush in 2007. While this was not solely an education law, its goal of encouraging more innovation and making the U.S. more competitive included provisions that stressed the importance of STEM education through improving teacher quality in STEM areas and better alignment to postsecondary (Gordon, 2014, pp. 142-143; Teitelbaum, 2014a).

Since NCLB's inception in 2002, the amount of data on each public school across the nation has increased rapidly. This focused the public eye on the performance of poor and minority students and on "failing schools." Although the law itself never refers to "failing schools," this term seemed to catch-on in the mainstream and as the number of schools fell into this category increased so did the public awareness and perception that the public schools were failing. Using data from an annual Phi Delta Kappa/Gallup poll and New York Times articles, Reckhow (2013a) shows that NCLB led to the growth in prominence of the term "failing schools," to a declining opinion of public schools, and the belief that public schools could not fix themselves

but needed help from the private sector creating a great opportunity for foundations to intervene (pp. 18-21).

As the numbers of schools included on the various federally mandated “failing schools” lists increased each year, there were new calls to intensify the reform efforts. Democratic President Obama answered many of these calls when he proposed the Race to the Top (RTTT) competition. States submitted applications to win a portion of the \$5 Billion available. Among the elements necessary to compete, states had to adopt college and career ready standards, known as the Common Core standards, and tie accountability provisions to them such as teacher evaluations, and they had to have policies to encourage charter school growth (U.S. Department of Education, 2009). RTTT can be seen as further building on NCLB’s standards, accountability, and school choice elements and further reinforcing the parallel goals of educational excellence and equity that had unified educational actors of different ideas and values since the 1980s.

Interesting to note however, there were priorities given in the RTTT application process with the second most important priority, labeled “Competitive Preference Priority—Emphasis on Science, Technology, Engineering, and Math.” States that wanted to get additional points for their application needed to have “a high-quality plan to address the need to (i) offer a rigorous course of study in mathematics, the sciences, technology, and engineering; (ii) cooperate with industry experts, museums, universities, research centers, or other STEM-capable community partners to prepare and assist teachers in integrating STEM content across grades and disciplines, in promoting effective and relevant instruction, and in offering applied learning opportunities for students; and (iii) prepare more students for advanced study and careers in the sciences, technology, engineering, and mathematics, including by addressing the needs of underrepresented groups and of women and girls in the areas of science, technology, engineering, and mathematics” (U.S. Department of Education, 2009). Not surprisingly, both the Business Roundtable and the U.S. Chamber of Commerce were supportive of RTTT (Business Roundtable, 2009; U.S. Chamber of Commerce, 2009). What is clear here is that at some point between the NCLB reauthorization attempt in 2007 and the RTTT of 2009, STEM education had gained some momentum, enough so that it was included as one of the top priorities of

the RTTT competition. What remains unclear is how this happened and what role corporate philanthropy played in bringing STEM to the forefront of U.S. education policy.

The early 2000s also marked a change for private philanthropy in education. The end of the Annenberg Challenge in the late 1990s can be seen as a new beginning in educational philanthropy. According to many scholars and education experts, Annenberg's contribution at \$500 million, the largest single donation to education in U.S. history, was a major disappointment. It did not achieve the goals it set out to achieve and its results were minimal when considering the amount of funding from Annenberg and the additional \$600 million in matching funds and services. The results of the Annenberg Challenge caused foundations to question their approach to funding education (Colvin, 2005; Hess, 2005b, pp. 4-5; Ravitch, 2010, p. 195; Reckhow, 2013a, p. 30) but the addition of new players also added to this discussion.

Frederick M. Hess (2005) analyzed the major education funders over between 1998 and 2002 and their priorities and methods of involvement. According to his research, the traditional, large, and well-known education funding foundations such as the Annenberg Foundation, the Pew Charitable Trusts and the Rockefeller Foundation were replaced as top funders by a new set of funders which included foundations such as the Gates, Walton, and the Broad foundations. These new foundations were more likely to be more hands-on and had little patience in the bureaucratic ways of traditional school systems, preferring to fund nontraditional or innovative programs and charter schools instead of funding traditional education causes such as professional development or curricular initiatives (Hess, 2005b, pp. 5-6).

According to Jay P. Greene (2005), philanthropy's \$1 Billion in grants each year are less than one percent of total K-12 spending valued at more than \$450 Billion per year. As a result, he argued that philanthropic actors would get the best value for their money if they invested in high-leverage strategies such as research and advocacy, innovative school or administrative structures, and by creating alternative paths to teacher and school leader certification and associations. His research however demonstrated that the largest foundations were investing minimally in these types of high-leverage strategies in 2002. Clemens and Lee (2010) pointed out that since the

fiscal environment of the 1980s, philanthropists have gone from a partnering with government model to an influencing government model by bringing together powerful actors to push for the adoption of favored policies and system-wide transformations.

It seems some foundations heeded Greene's advice. In her book, *Follow the Money: How Foundation Dollars Change Public School Politics*, Sarah Reckhow (2013a) noted how much has changed in education philanthropy because of major foundations giving away more money, their open involvement in advocacy, and their business-style of targeted giving (p. 27). In an analysis of giving by the Gates Foundation, she finds while they gave more than 40 percent of their education grant funds directly to school districts in 2000, by 2010 that share was 15 percent while the share going to national policy advocacy and research grew more than seven fold from roughly two to 15 percent during that same time period (Reckhow, 2013b). In 2013, of the top 50 K-12 education foundation grant recipients in the U.S., just three were school districts, the rest were nonprofit organizations (Foundation Center, 2013a). Similarly, based on the survey results of 184 foundations that give grants for K-12 education purposes, 61 percent said they give grants to influence public policy with 34 percent planning to give more funding for public policy initiatives and none of them were planning to decrease in this area (Grantmakers for Education, 2011). Clearly there is a shift towards educational advocacy among major foundation funders of education.

Research from 2014 further shows how top foundations in K-12 education had changed the way they invested in education between 2000 and 2010. During this time, as the federal government became more active in education policy, the 15 foundations that gave the most to education nearly doubled the amount given to national education advocacy and research organizations from \$486.6 million per year to \$843.7 million per year⁵². Meanwhile, the number of grantee organizations that engaged in these activities that received \$1 million dollars or more per year grew from 7 to 34. Foundations also shifted from funding public institutions such as schools, state departments of education, and university programs towards alternative providers of education such as charter schools, alternative teacher training and recruitment programs, and towards venture capital education funds. Lastly, the top foundations

52 In inflation-adjusted 2010 dollars

also started to fund many of the same organizations in education during this time. In 2000, about 23 percent of the funds from the major education foundations went to organizations that received funds from two or more other major foundations, by 2010, 64 percent of all funds went to such organizations. The type of organization receiving funds from multiple these major K-12 funders also changed from organizations that focused on improving public education to those that supported alternative or parallel providers of education and teacher training (Reckhow & Snyder, 2014).

Some of the shift towards federal education policy making can be explained by a public that has become increasingly concerned about the state of public education and more specifically, about the achievement gap. This made the public more open and even encouraging of federal intervention in education in the early 2000s. As the federal government increased its control in K-12 education, it is hardly surprising that foundations started to spend more of their resources at this level. The other reason for increasing funding for policy and advocacy work at the federal level are the many barriers to long-term change foundations face at the local level such as changing boards of education and power dynamics that limit the effectiveness of their initiatives (Carr, 2012, pp. 244-246). What became questionable was the level of coordination and the degree of collaboration between some of the top foundations and the federal government.

As mentioned above, the RTTT initiative went further in its goals of standards and assessments. The RTTT funds were a tiny portion of the American Reinvestment and Recovery Act (ARRA), a fund aimed at reinvigorating the American economy after the devastating economic crash of 2008. States applying for RTTT needed to adopt the Common Core Standards, increase the number of charter schools, and tie teacher evaluations to student test results among other reforms. Any of these reforms in themselves would usually have been next to impossible to achieve; however, the carrot of millions of dollars for education for cash strapped states was enough for many states to adopt policies to make them competitive in the RTTT process. Not only were these policies largely aligned with many of the policies of the large education foundations such as Gates and Broad, there was significant collaboration between the U.S. Department of Education and these foundations in the development of RTTT (Ravitch, 2013, pp. 14-15, 28; Tompkins-Stange, 2016, pp. 115-117). Some

of this was the result of staffing at the Department, which had several senior level people and appointees with experience working at foundations or nonprofits heavily funded by them. It was also because of the new philanthropy liaison position created specifically to more efficiently channel relationships with funders (Carr, 2012, pp. 201-203). In addition, the Gates Foundation went so far as to fund grant writers for promising states to develop their RTTT application to tilt the process in favor of states the foundation favored (Ravitch, 2013, pp. 15). After much criticism though, they agreed to fund grant writers for all states that were applying.

Similarly, the Investing in Innovation Fund (i3), was also part of the ARRA funds and was also a competitive grants program; which gave the secretary of education the right to select and fund entities that had been successful in closing the achievement gap. All applications needed to prove there was a philanthropic partnership; thereby institutionalizing the role of philanthropy in federal education policy. With grant winners needing to show that at least 10% of the funding would be matched by outside funders, foundations had veto power in selecting which initiatives would go forward (Carr, 2012, pp. 202-203). The Gates Foundation played a leading role in bringing together 11 other foundations to provide matching funds of \$500 million (Bill & Melinda Gates Foundation, 2010).

Simultaneous to the new ways that major foundations were engaging and investing in education, there was also a large increase in the amount of philanthropic funds going to education. By 2004, the total amount of foundation funding to K-12 education was more than six times as much as it was in 1990, growing from about \$407 million to \$2.7 billion. While this represents an extraordinary increase in foundation giving, even the 2004 figure represents just 0.53% of total K-12 expenditures (Bacchetti & Ehrlich, 2007, p. 16).

As for corporate foundations during this time, their giving roughly doubled to a total of about \$3.4 billion with 26 percent of grant money going to education (Foundation Center, 2006). It is difficult to estimate how much of the funding went to K-12 or higher education; however a study of the philanthropic giving of 72 large companies similarly found overall giving to education to be 26.9% of all corporate giving. Giving to K-12 education was at 11.6 percent or 43 percent of all education funding

(Shah, Morgan, & Steven A. Rochlin, 2006, p. 20). This shows that there was substantial growth in philanthropic giving in education between 1990 and 2004 with overall philanthropy growing at a faster rate than corporate giving.

Corporate philanthropy had a long tradition of investing in higher education either through scholarships or university programs that were related to their area of business. Between 2004 and 2012 however, there was a shift in corporate philanthropy priorities from higher education to K-12 education among corporations that participate in the Committee Encouraging Corporate Philanthropy's survey (Committee Encouraging Corporate Philanthropy, 2013; Shah et al., 2006). This trend continued in the 2016 report as well where education continued to be the top priority overall but K-12 education received 16 percent of all corporate philanthropic giving, while higher education received 13 percent (Committee Encouraging Corporate Philanthropy, 2016, p. 14).

In the early 2000s, there was also a call for corporations also to change their approaches to philanthropy. In their pivotal paper, Michael E. Porter and Mark R. Kramer (2002) argue that most corporate philanthropy at the time was poorly used. "The majority of corporate contribution programs are diffuse and unfocused. Most consist of numerous small cash donations given to aid local civic causes or provide general operating support to universities and national charities in the hope of generating goodwill among employees, customers, and the local community. Rather than being tied to well-thought-out social or business objectives, the contributions often reflect the personal beliefs and values of executives of employees" (p. 6). They further argued that corporations should use philanthropy towards their competitive advantage and should be a part of the company's overall strategy, not just an add-on. According to them, corporations with philanthropic endeavors that are aligned to improving their competitiveness are best suited to identify the strongest grantees, bring together other funders, improve the performance of grant recipients, and to put the best practices into wide-spread use.

According to Porter and Kramer, corporations are ideally situated to address some of the world's most pressing problems but few corporations were actually addressing philanthropy in this way. (Porter & Kramer, 1999, 2002). In their analysis of the

philanthropy of several companies, Bruch and Walter also found that corporations rarely give strategically (Walter & Bruch, 2005). In 2012 however, the Committee Encouraging Corporate Philanthropy found more U.S. corporations were strategic in their giving by focusing on social-impact initiatives aligned with their expertise (2013, pp. 13,19; see also: The Center on Philanthropy at Indiana University, 2007, p. 31).

As described above, the 2000s were a time of significant change in federal education policy but also the way that foundations interacted with education policy makers and institutions. These years also represented significant growth in philanthropic giving to education overall but also for corporate philanthropy. The question is how did these changes affect the way corporations gave to education or for that matter, did they change the way they were giving to education?

Until this point, the focus has been on what was happening in general K-12 education in the early 2000s but it is also important to briefly focus on what was happening in the vocational sphere. As noted, in the 1990s, there was the School-to-Work program; which was ultimately considered unsuccessful because industry engagement was limited and did not result in meaningful change in career and technical education (CTE) and the funding was not renewed. (Hershey, 2003; Hershey et al., 1999). NCLB's focus on academic subjects and testing were seen by some as further diminishing the role of CTE (see for example: Chadd & Drage, 2006; Gray, 2004).

By the 2006 renewal of the Perkins Act went further in the direction of pushing CTE to be more focused on academics. Passed after NCLB, Perkins IV emphasized the need for instruction to be "rigorous and challenging" and to include measures of post secondary success and links to higher education and to generally be more aligned with the principles of NCLB (Fletcher & Zirkle, 2009, pp. 502-503). This could be seen as a way to better align CTE with NCLB and to provide students in CTE with more pre-requisites for college; which is an admirable goal but it does not encourage tighter ties with industry, it focuses on education that does not have industry influence. Buried in the legislation was the creation of partnerships between schools and higher education institutions and other organizations, including industry ("Carl D. Perkins Career & Technical Education Act," 2006).

With so much focus on going to college and the image problem vocational education had long had, it is hardly surprising that there was a decrease in the number of students who were actively pursuing a CTE path in high school. Between 1982 and 2004, the percent of students who took three or more CTE courses⁵³ in one occupational area dropped from 30 percent to 17 percent. Students who do not take occupational courses at all remained relatively constant; while those who take at least one occupational course increased slightly over time. Meanwhile the percent of students graduating with an academic focus⁵⁴ grew substantially with 15 percent having taken such courses in 1982 but 60 percent having taken such courses in 2004. Even among students who had an occupational concentration, the percent also having an academic focus grew from 10 percent to 17 percent in that same time period (Dalton, Lauff, Henke, Alt, & Li, 2013, pp. 22-28). As the authors of this multi-longitudinal study explain, CTE coursetaking has moved from being a clearly defined set of vocational courses for students who were not on an academic track and leading to a job right out of high school to an exploratory program for all students. This shift has resulted in “smaller groups of graduates intensively studying an occupational area and larger groups of graduates earning a few occupational credits. It also coincides with shifts toward more academic coursetaking, improved academic achievement in math, and more involvement in postsecondary education for those with more involvement in occupational preparation” (Dalton et al., 2013, p. ix).

This shift towards less concentrated vocational education and more exploratory offers was also accompanied by a decrease in funding for CTE. Between 2003 and 2013, federal funding through the Perkins funding decreased by about \$188 million. Additionally at the state level, funding for most states for secondary CTE remained stable but at the local level, most states reported a decrease in funding and very few reported an increase (National Association of State Directors of Career Technical Education, 2013, pp. 2-5).

⁵³ Courses in a single occupational area is a traditional measure of CTE involvement. It is seen as a way to earn specialized skills, which are helpful in preparing for further training and education or landing a job.

⁵⁴ Graduates with an academic focus earned at least 4 credits in English and 3 credits each in mathematics, science, and social studies; graduates with a general education focus did not meet these requirements.

With the the increased focus on academic achievements and testing under NCLB, RTTT, and i3 and the decrease in vocational education participation, President Obama's foray into the need for vocational education in 2009 was a bit of a surprise. However, with a youth unemployment rate of 18.5 percent in the United States, the highest rate since 1948 when data for the youth sub-group started to be collected (Bureau of Labor Statistics, 2009), there was a renewed interest in vocational education. Initially Obama's focus was on post-secondary education but still, it was not on just getting a degree. Rather he emphasized vocational training or apprenticeships as part of the goal for all Americans to increase their education credentials. In his first address to a joint session of Congress, he said, "I ask every American to commit to at least one year or more of higher education or career training. This can be community college or a four-year school; vocational training or an apprenticeship. But whatever the training may be, every American will need to get more than a high school diploma" (Obama, 2009).

There were also skeptics of the mantra that everyone must have a four-year college degree. With only about a third of American adults actually achieving that level, there were concerns for those who did not have college degrees in an environment that seems to value them above everything else. There were also worries about the implications of pushing evermore students to go to college when the college dropout rate that was nearly 40 percent. In their often-cited report *Pathways to Prosperity*, professors from Harvard's Graduate School of Education, called for new pathways to careers. The authors point to the lack of connection many students see between their program of study and what is valued in the labor market as a driving reason for high dropout rates and frustration among youth. In their recommendations for actually building more pathways, they call for employers to take a much larger role in CTE through setting standards and designing programs of study but most importantly, in offering more work-linked opportunities. As they noted however, companies had not been playing this role. "In recent years they have been at the forefront in championing such reforms as choice and accountability. But for the most part, they have left the job of education and working with young adults to educators" (Symonds, Schwartz, & Ferguson, February 2011, pp. 9-11, 30 quote p. 29). Was this call to action answered? Did businesses start to become active in education and more specifically secondary education in this way? Did this impact their philanthropic investments?

By his 2013 State of the Union address, President Obama said: “Let’s also make sure that a high school diploma puts our kids on a path to a good job. Right now, countries like Germany focus on graduating their high school students with the equivalent of a technical degree from one of our community colleges. So those German kids, they’re ready for a job when they graduate high school” (Obama, 2013). This is an interesting twist from an American perspective where vocational education has long had a lower status than the general or academic tracks (Busemeyer & Trampusch, 2012, p. 13; The Economist, 2010) and “excellence for all” in education has been the focus of reforms over the last thirty years (Hess, 2010; Schneider, 2011, Chapter 1). It is also a twist from focusing on vocational education at only the post-secondary level to the high school level.

It is not clear where the influence to address CTE came from but it is interesting to note his next reference to the Pathways in Technology Early College High School, better known as the P-Tech initiative. A collaboration between New York City Public Schools, the City University of New York and IBM, it was referenced because students would graduate work-ready with a high school diploma and an associates degree in computers or engineering and have industry-relevant experience (Obama, 2013). Here we can see a new approach for industry to be active in secondary education. According to IBM, while they had long invested philanthropically in education initiatives such as standards, they were troubled by the low-levels of STEM skills and the unpreparedness for work exhibited among many graduates. To address these issues, they created this new CTE model because “IBM believes that the public, private and not-for-profit sectors should partner with one another to create a new model for STEM education and workplace preparedness” (IBM, 2017).

The call to be more active in CTE also appeared in the Obama administration’s Blueprint for Transforming Career and Technical Education. Noting that the Perkins Reauthorization in 2006 did not go far enough to “systematically create better outcomes for students and employers,” the Blueprint set forward four core principles for the next reauthorization of the Perkins Act:

“(1) Alignment. Effective alignment between high-quality CTE programs and labor market needs to equip students with 21st-century skills and prepare them for in-

demand occupations in high-growth industry sectors;

(2) Collaboration. Strong collaborations among secondary and postsecondary institutions, employers, and industry partners to improve the quality of CTE programs;

(3) Accountability. Meaningful accountability for improving academic outcomes and building technical and employability skills in CTE programs for all students, based upon common definitions and clear metrics for performance; and

(4) Innovation. Increased emphasis on innovation supported by systemic reform of state policies and practices to support CTE implementation of effective practices at the local level.” (U.S. Department of Education, 2012, p. 2)

Numbers one and two indicate a preference for much more involvement of industry than the 2006 version. There was also significant support from the business community with the Business Roundtable, the U.S. Chambers of Commerce, and several other business organizations advocating for the Blueprint (Opportunity America, 2017). By May of 2017 the Perkins Act had not been reauthorized but the new foray of business and industry groups into the area of CTE does open questions about whether or not there was significant support for CTE initiatives from corporate philanthropy as well.

Summary and Open Questions U.S. Early 2000s

By and large, the role of industry in the U.S. in K-12 education did not change much in the early 2000s. Following the same path since the 1980s, American corporations focused mainly on general education issues through their philanthropic giving initiatives; however, there were major concerns among the corporations about the impact their giving was having, especially with the rise of new education philanthropic donors who were approaching education with more hands-on and outcomes-based approaches. How did this change the way companies were giving to education? Did they also start to focus more on initiatives where they could demonstrate more impact? Were they concerned with aligning their giving more to their competencies as companies as some advisors were recommending? What did this mean for K-12 education?

While NCLB was a considered a big shift in the role of the federal government in the K-12 education space and there were plenty of reactions among education policymakers and many groups involved in education, it is not clear how or if NCLB really affected corporate giving to K-12 education. Did NCLB have an impact on the way corporate philanthropy approached education? Did the flow of data the resulted from NCLB change the way they invested in schools? Although, industry associations seemed to support the reauthorization of NCLB, it appears there was also concern about the STEM subjects and the narrowing of the curriculum. Did this drive them to address education topics that were not covered by NCLB through other avenues or how did STEM rise to prominence?

Also in the early 2000s, vocational education policy seemed to be focused more on alignment with the priorities of NCLB by ensuring that vocational programs were academically rigorous and preparing students for postsecondary education but with virtually no efforts on better partnering with employers. By 2013; however, there was clearly a change in direction, with President Obama and the Blueprint from the Department of Education that emphasized the need for industry to be more involved in vocational education. Industry associations seemed to be in agreement with this direction. While it is clear IBM's corporate philanthropy was on board with such a change in direction, were other major companies also doing this? Were they funding vocational programs philanthropically? If so, what caused them to do so?

Comparison of the 2000s in Germany and the U.S.

In the U.S. major companies and business associations continued their involvement in the early 2000s in K-12 education by pushing for reforms such as standards and assessments and improving teacher quality. They were heavily supportive of NCLB, which also enjoyed bi-partisan support and the push from civil rights groups because of its focus on better identifying the achievement gaps but also the accountability provisions. Although they supported the reauthorization of NCLB, companies and industry associations became concerned about a narrowing of the curriculum and a lack of a focus on science and technology. They became active in other education endeavors aimed at improving science education and ultimately STEM education. This does not mark a major shift for the business in education but it does warrant the question of why some of them became involved in the STEM education movement.

Although German companies tried to raise awareness about the high number of students arriving unprepared for their dual training programs over the years, it seemed to have fallen on deaf ears. It was not until the PISA shock happened that German industry was able to become more involved in K-12 education issues. The international comparison and the immense media coverage that followed it, which showed Germany's 15-year-olds performing below the OECD average, helped them make the point they had been trying to make and opened the door for their involvement. The industry associations jumped on the opportunity as they and other actors advocated for many reforms including: new standards and assessments, teacher quality improvements, better support for disadvantaged students, early education opportunities, more school autonomy, and longer school days. This marked a new branch of involvement in education for German industry, which is quite similar to their traditional role in the U.S. but begs the question of how corporate philanthropy was involved and how they became involved in MINT education.

The vocational education situation in the U.S. and Germany was of course, quite different. In the U.S., companies continued to have a minimal role at the secondary level in the early 2000s with ever fewer students taking vocational paths and a focus on academic subjects above all other. Around 2013 however, there seemed to be a growing interest in encouraging more company involvement. This was made obvious by President Obama who started to talk about the importance of vocational education and even highlighted a program that was started by IBM's foundation. Although this does not mark a large shift in company involvement in education, it does represent a shift in the attitude from the highest level of government about vocational education and the role of corporate philanthropy in making it happen.

In Germany companies remained active in dual vocational training but there was also a clear decline in the number of apprenticeship places available and an increase in the selectivity of the dual training programs. This resulted in an increase in the percent of students unable to find a training spot and instead entering the transition system even though there was actually a declining youth population. At the same time with an increase in the number of students deciding to go to university instead of doing a dual training program, there were also concerns about the quality of the students available

for the dual training system. Some of these concerns were addressed in the Vocational Training Act of 2005, which allowed more flexibility within the system to allow for additional routes to vocational certificates in an effort to open more opportunities for students trapped in the transition system. Regardless of the reforms, it was obvious that unlike the decades before, industry could no longer be expected to solve the problem of untrained youth through their dual vocational training programs. But could they use philanthropy to address some of these issues?

Philanthropy in education in the U.S. and Germany were experiencing major shifts in the early 2000s. In both countries there was rapid growth in the involvement of philanthropy in education. In Germany, the number of foundations active in education seemed to increase exponentially, while in the U.S., it was the philanthropic funds. In the U.S. the traditional largest funders in education were giving way to a new bunch of funders with a distinctly different style of investment that was much more outcomes-based, focused on scalability, and hands-on. This led to more funding being channeled to nonprofits instead of school districts and a focus on education policy endeavors. Corporate philanthropic giving also increased during this time and while there was a focus on being more strategic in their giving and better aligning their giving with the expertise of the company, it is less than clear if that happened. In a similar light, many of the new foundations in Germany saw their roles as bringing innovative ideas and social policy change, a different model from the traditional corporatist German foundation sector that operated as a provider of state-funded services. The larger companies had professionalized staffs for their philanthropy, strategic plans, and saw their investments as a part of their company's overall identity. For large companies newly active in German education, this marked a shift towards more new ways of being active in education and opened many questions about how they see their role in education.

In both Germany and the U.S., there were significant K-12 education events and reforms that took place in the 2000s that impacted the way the business and philanthropic communities engaged in education. There are however, many unanswered questions about if and how these education happenings affected the way companies interact in K-12 education, especially from a corporate philanthropic

perspective. These questions will be addressed in the interviews and through document analyses in following chapters.

Chapter 6: Germany Findings

Overview

As detailed in my historical chapter, from 1945 through 2000, the main way corporations in Germany were involved in K-12 education was through vocational education, more specifically, through dual vocational training. There were some corporate foundations that were active in education but aside from the really large foundations such as the Bertelsmann or Bosch foundations,⁵⁵ there is little evidence of substantial involvement in education. The 2000s chapter showed that is changing, that increasingly German companies and their foundations are becoming involved in general education. The question is why and how they decided to be active in general education and even more specifically, in MINT education.

PISA Shock and Corporate Engagement in Education

Before the PISA shock there were clear signs of troubling trends in the youth population from a corporate perspective. The experts I interviewed confirmed that the concerns about the quality of future workers due to changes in the age distribution of the population, migration, and the educational preferences of many youth. These were driving reasons for corporate philanthropic involvement and changes in their involvement in K-12 education over the last 25 years but especially for some of the years leading up to PISA.

TABLE 6.1: NOT ENOUGH WORK-READY CANDIDATES

“as the awareness of the demographic challenges is growing, and the awareness of the failing policy, so they're (the state) not addressing the problem in an adequate way, and everybody knows that, but nobody's talking about it. The companies are seeing that the problems are growing faster than any kind of solution in the normal systems.” Line 85 ~ **GI1M**

“if there's anything I would think companies understand a lot clearer is that we will have a war for talent in our country and for sure that is another reason why people decided, let's go in there.” Line 167 ~**GI2M**

“PISA was for industry also extremely interesting because we at least politically had already been saying that there were not enough youth who were well-prepared to complete and apprenticeship Lines 106-109. That there are many school-aged students that had poor reading skills even though they had graduated or they could not do math well. They did not meet the requirements required for the apprenticeship. The schools ignored this until PISA became known and then it was black on white that we had certain high risk groups of 15 year-

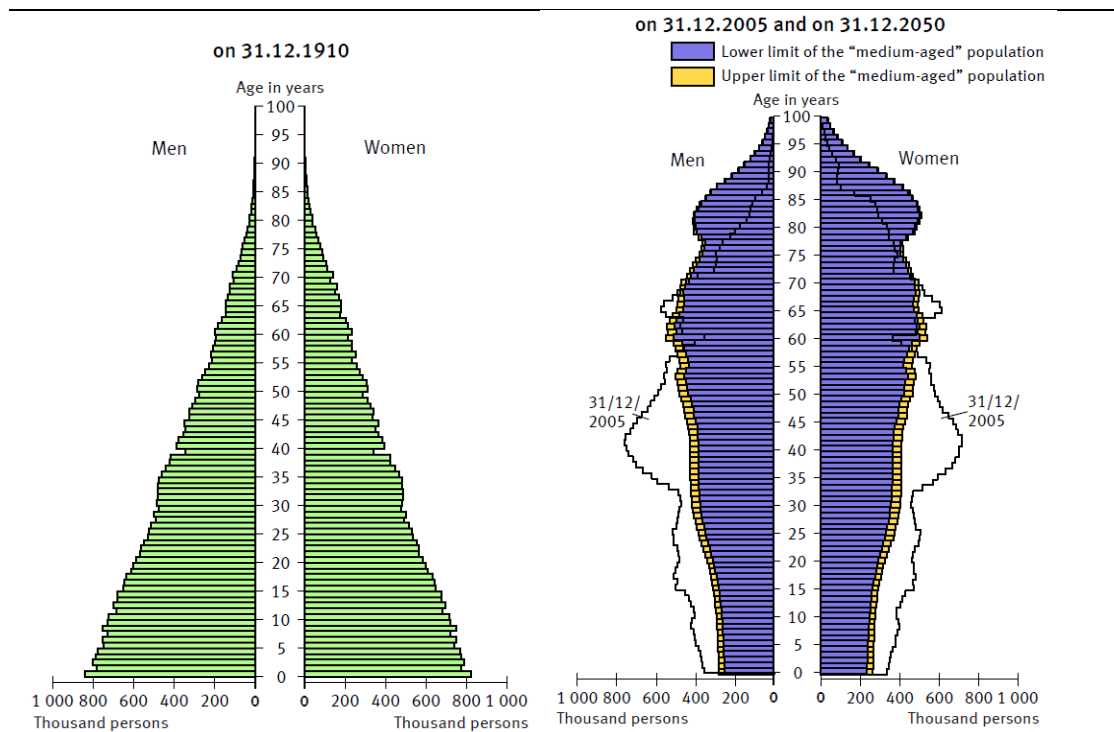
⁵⁵ Both of these foundations own the corporation that bears their name. They are not CSR-style foundations (see historical chapter for more on this).

olds, from a range of 20 to 25% who were on the elementary school level for reading, writing, and math.” Lines 109 ~**GI5F**

“Another big driving issue are the changing demographics and the language challenges- now even more so with the refugee situation but also in the past.” Lines 105 ~**GI6F**

The concerns about the declining youth population mirror the changes evident in Germany’s population. Figure 6.1 shows how within 100 years Germany’s population went from a tree form, meaning fewer older people and a younger population that grew each year to a Döner-shaped⁵⁶ form where there are more older people and a shrinking youth population.

FIGURE 6.1: AGE STRUCTURE OF THE POPULATION IN GERMANY



Source: Statistisches Bundesamt (2006). Germany’s Population by 2050 — Results of the 11th Coordinated Population Projection, Wiesbaden 2006; www.destatis.de. Page 16, Figure 3.

From an education perspective, this meant a decline in the number of school graduates of all kinds. GI6F described it with “what plays a role overall is the demographic changes as a whole because we simply know that the number of young people that we can at all employ will decrease. Then it is the question, we must

⁵⁶ Large piece of meat usually grilled on a vertical rotisserie, often found in Turkish restaurants in Germany, also referred to as Döner Kebab.

consider that we as a society cannot manage it if we lose young people or if the education system fails. As a result comes the thinking that we must invest early and start the support early so that the highest amount of people possible, or the highest amount of young people can make a good transition into their working life” (Lines 194). According to the Federal Statistics Office in 2006, “Today there are nearly 4 million young people at apprentice age, ranging from 16 to under 20 years. By 2012 that number will have fallen to as few as about 3 million” (Statistisches Bundesamt, 2006, p. 5). A decrease in the youth population however is just one part of the puzzle for employers when it comes to finding enough suitable apprentices.

Another issue is the increase of students going to the Gymnasium or other high school forms and then choosing to go on to higher education instead of dual vocational training. The percent of students going to Gymnasium continued its increase from the 1990s into the 2000s so that by 2014, 34 percent of students attended one. An additional 16 percent of students attended the newly formed integrated secondary schools, which also offered paths to attain the university entrance requirement, the Abitur (Malecki, 2016, p. 13; Nikolai & West, 2013, pp. 61-62). From an education and career path perspective, this has led to higher proportions of students going to higher education and a much lower proportion going the vocational route, leaving some employers scrambling to find Azubis (nickname for dual vocational trainees).

In addition to the demographic trends described above, the educational preferences among German youth have changed drastically over the last decade. For the first time ever, in 2013, the percent of students going on to higher education institutions exceeded the percent of students going to dual vocational training (Autorengruppe Bildungsberichterstattung, 2014, pp. 99-100). When asked if they wanted to go to higher education or do an apprenticeship, just 47 percent of students completing high school in 2012 said they wanted to go on to dual vocational training (BIBB, 2013, p. 75). Part of what is driving this are changes in the economy but part of it is also a cultural shift that values higher education above all else and the perception that higher education leads to better career chances, higher income, and societal prestige. These changes in preference are also reflected in the high percent of students going on to and completing higher education. In 2000, just 18 percent of young Germans received an academically focused upper-postsecondary degree (tertiary type A)

compared to an expected 30 percent in 2012 and at the same time, the income gap between those with higher education and those without has grown (OECD, 2014, p. 4). All of this adds up to having less potential workers overall and fewer high-quality dual vocational training candidates.

The concerns and data about the demographic challenges that threaten the ability of companies to find enough high-quality workers were clearly present. Many of the experts explicitly said that companies were concerned about the future of their apprenticeship or dual vocational training programs in terms of how they would find high quality applicants. This sentiment can be seen as a critical antecedent or causal factors that were happening before the critical juncture that combine with other factors during the critical juncture (Slater & Simmons, 2010, pp. 888-890; Soifer, 2012, pp. 1574-1577). It is also clearly tied to the long history of German companies in vocational training.

Another factor proceeding PISA that I did not anticipate but was brought up by a few of the experts and highly related to the need to prepare pupils for careers was a perceived change in the relationship between industry and schools. Expert GI5F describes this as: “In the late 1990s and in the early 2000s strict separation between schools and businesses changed a bit because schools needed additional support. Youth and children need to be well prepared for their lives and a career is a portion of life. So the awareness regarding the need for this type of career preparation grew and it became clear that it would be both interesting and it would make sense if the companies and the schools worked together on these specific initiatives” (Line 17).

She went on further to say “because vocational education is the responsibility of the companies in Germany, they also have a big interest in finding young people for their careers that involve vocational training, to fill their vocational training places. That also makes it easier for the schools when they search for such social partners and that is a change that has taken place over the last 15 years” (Line 27). “The companies of course wanted win-over the talented school completers for their apprenticeship programs” (Line 73). This change in the social acceptance around the relationship between industry and education can also be seen as a critical antecedent. Without this change, the actions of industry in education may not have been as easily accepted.

As these changes in demographics and the relationship with industry were shifting, along came the results of PISA in December of 2001, also known as the PISA Shock. From the perspective of all of the experts I interviewed, the PISA results called companies to act in education or provided them with more of an opportunity to do so.

TABLE 6.2: PISA LED OR ALLOWED COMPANIES TO ACT

“The politicians often say, well it (PISA) also opened the big windows of opportunity for those who were able to change circumstances.” Line 199// “suddenly there was a rush of philanthropy overall into this field” Line 207 ~**GI2M**

“The words of industry ... and industry groups and companies themselves were listened to more than before (PISA). Line 120” Line 160 ~ **GI5F**

“When the PISA results came out, it was a really big topic in companies and the question was – can we manage our way out of this? What then are the requirements? Which contributions can we make to help Germany’s performance? That had for sure an effect and it initiated a process. That I see for sure. If the positioning of the companies was effected, that depends on how strong their strategy for social engagement was but that there was an effect I would say for sure.” Line 154 ~**GI6F**

“Many corporations did become active in education during this time.” Line 44 ~**GI3F**

Germany’s fascination with its PISA results were unparalleled by any other country as evidenced by media coverage but also by the number of election campaigns that addressed education in the years immediately following (Olano et al., 2010, p. 10). While this many not have been a surprise for the companies, the OECD’s linkage of the PISA ratings with economic competitiveness (Hartong & Münch, 2012, p. 6; Martens & Niemann, 2013, p. 319) opened the door for companies and their foundations to have more of a voice in education issues. The opening of the door or as GI2M put it, the “windows of opportunity” that PISA presented for companies and their foundations to become active in education is a permissive condition in the sense that it altered the context in a way that increased their power to act (Soifer, 2012, p. 1574).

While the PISA results were instrumental in opening the door for companies and their foundations to act, there were also many changes afoot in corporate philanthropy. When asked to compare corporate philanthropy in the 1990s to more recent times GI2M responded with: “Good question there is what would you have seen in 1990s?” (Line 27).

He then went on to explain the differences in corporate philanthropy in Germany by citing big traditional companies that are owned by foundations such as Bosch or Bertelsmann and companies that create foundations and are active philanthropically, which have become more popular recently (often referred to as CSR style). According to him, many companies feel both a pressure to increase their corporate citizenship and a pressure to justify their giving. “But overall, corporate philanthropy really first has, really the last fifteen years are the years where they really moved into the limelight, and where they have also approached things a lot more strategic. Before that there was a lot more, what we to a certain extent call charity or conditional grant making” (GI2M, Line 40).

Corporate philanthropy acting more strategically or at least wanting to be more strategic and focus on the outcomes of their giving were also common themes among all of the experts I asked about the differences in corporate philanthropy over the last 25 years. Some argued however, that they were not strategic enough.

TABLE 6.3: CORPORATE PHILANTHROPY MORE STRATEGIC

“There is a movement. I think, the movement is going from corporate by chance philanthropy, to strategic social investing.” Line 48 ~**GI1M**

“I think it (strategic philanthropy) has developed in the last years- definitely not just that the company says ‘we are going to give money for anything because someone we know or because it was sold in a nice way or something like that.’ It is also not just about improving our image but it is with a much stronger focus on which effects we want to achieve in the society.” Line 56 ~**GI6F**

“They needed to be more inline with their parent company, need to be organized and show that there is a reason for their giving, that it leads to something. Line 28-29// They used to be charity organizations that just gave money to good causes. Now they are much more impact-based.” Line 23 ~**GI3F**

Strung throughout the quotes above are concepts such as “strategic social investing,” “impact-based,” and maximizing effects in society. This suggests that companies increasingly see their philanthropy the way venture philanthropists (VP) do, as investing in social purposes but with an eye on effectiveness and efficiency and being more actively involved. VP is a shift from traditional philanthropy (TP), which aims to solve the root causes of social problems but with more implicit expectations of outcomes. It also furthers the concept that the practices and strategies of VP are

gaining acceptance in the European philanthropy scene (Adloff, 2010, pp. 401-402, 413; Mair & Hehenberger, 2014, pp. 1174-1175).

Along with the desire to be more strategic, some experts mentioned an increasing professionalism within corporate philanthropy but with the caveat that it had not professionalized enough. For example, some mentioned that although more companies actually have someone devoted to corporate philanthropy as their full-time job, more often than not, these people are not actually expert in philanthropy or in the fields the company is active in or are in departments of little value to the company. Big companies with big foundations; however have moved to professionally trained staff or to more important departments within the company.

TABLE 6.4: PROFESSIONALIZATION OF CORPORATE PHILANTHROPY

“My experience is that the people responsible for the CSR in the big corporations are always second-class. Line 438. If the corporate responsibility is part of the communications, or part of the marketing, where it is very often, then of course it's unimportant.” Line 442 ~**GI1M**

“first step in that professionalization is that actually they have people that are 100% committed to only working for the foundations.” //” you normally have people sitting there that have been in the past either in the communications department of the company, or they were in some kind of another department of the company and then they suddenly are now with the foundation.” // (Big companies) “sooner or later staff hire experts for the field and not people that are connected to the company.” Line 80 ~**GI2M**

Part of this may also be related however to the size of the corporation. For example GI2M explained that bigger companies are more likely to have staff and be more strategic (Line 88). This largely mirrors Sebastian Braun’s (2010) research about corporate civic involvement overall: most German companies are reactionary in their funding and support of initiatives. They react to outside proposals and very few have action or evaluation plans but the bigger companies are more likely they are to have action and evaluation plans and to actively seek possibilities for their involvement (pp. 8-9). The emphasis on strategic philanthropy, and with it, the professionalization of corporate philanthropy among companies can also be seen as permissive conditions in the sense that it increased the ability for big companies to be philanthropically active and to diverge from their traditional roles of being active only in vocational education.

The combination of the release of the PISA results, with the concerns about the declining youth population and potential workforce, and the increased activity and

professionalization within corporate philanthropy led to new outcomes in corporate engagement in education. The exact outcomes and if corporate philanthropy really changed their ways as a result of PISA, differed among the experts. Some of the experts said PISA caused a big awakening among companies not active in education at the time. The increased interest in education; however, if it indeed happened, is a change in itself and would have changed the mix of actors active in education by bringing industry and corporate philanthropic actors who had traditionally not been involved into K-12 education debates.

This change in actors is part of a much larger number of new philanthropic actors active in education in Germany. Between 2000 and 2013, the number of foundations active in education grew from just over 2000 to 6,309. According to Striebing (2017), the tripling of foundations with an education focus is part of a new education regime; which was catalyzed by PISA. In former times, there were three types of secondary schools, most students went on to complete a dual vocational training, and foundations that were active in education mainly gave away scholarships, supported education institutions, and other input-oriented endeavors. More recently, all students are supposed to have a chance at reaching higher education, fewer students go on to dual vocational training, there is large concern about digital skills, and the schools themselves are output-oriented. There is a new role not just for education foundations but also for industry as the catalysts for change, networking agents, and in determining the themes get the most attention and innovation. This also explains why many of education foundations saw companies and industry associations as natural partners in their education work (pp. 24-25, 27, 35-36, 80-82). This would also explain why many companies would become much more active philanthropically in education.

Some of the experts mentioned investment in early education as something one would not have seen in Germany before the early 2000's. As GI6F put it "I think what is new when one looks back 25 years is that a focus on early education and care has developed. In the last 12 or 13 years we have come to understand preschools⁵⁷ as a

⁵⁷ Interviewee used the German word "kindergartens" but I translated it to preschools to coincide with the U.S. terminology for education institutions serving children before they enter formal schooling.

part of the education system, not just as a place where kids are taken care of. From my perspective, that the support starts earlier is a way that the support changed” (Lines 28-42). Others mentioned the launch of programs such as the German School Prize and similar prizes (GI12, GI5F), which were aimed at drawing more attention to education. These are both examples of outcomes that emphasize some of the reforms that industry associations were actively promoting at the time as well, namely early childhood education and an emphasis on including academic performance as a measure of success⁵⁸ (Raidt, 2010, pp. 96-98). This suggests that corporate philanthropy and industry were promoting similar reforms furthering the observation of Striebing (2017), that education foundations see companies and industry associations as natural partners (p. 80).

Another change cited by some of the experts is a shift from giving directly to schools through their booster clubs (Schulverein) to funding nonprofits or their own education-related initiatives. This was seen as a way to be more effective and to be sure that the funds were going for exactly what they wanted to achieve.

TABLE 6.5: CORPORATE PHILANTHROPY FUNDING NPOS, LESS SCHOOLS

“in the past they just gave money to certain schools or for certain NGOs and today they actually have pushed for their own NGOs, funding their own initiatives.” Line 139

~GI2M

“there are multiple studies that show that the greatest effects come not from working with the school students directly but with the teachers or with other relevant target groups. I think this is why companies are not giving directly to the schools but to institutions that work with and support schools.” Lines 140 ~GI6F

The mere formation of education NGOs and their own projects serve as their own reproduction mechanisms because they create new ways for corporate philanthropy to be active in education. Before when they were focused more on funding individual schools or their booster clubs, the ability to be active in the education policy field was for example quite limited. The creation of the new NGOs and initiatives also paved the way for corporate philanthropy to do so when other education problems arose. This also shows that as predicted, corporate philanthropy is following more of a liberal model of philanthropic investing, not the traditional German model of corporatist investing (Anheier & Daly, 2006b, pp. 17-20). In this sense, they are

⁵⁸ Academic performance is one element of the German School Award,

supporting alternative options to what the government is providing by not simply supporting schools but by increasingly supporting NPOs or their own initiatives to address large social issues because of a belief that the state is unable to do so.

The addition of new corporate philanthropic actors, becoming more strategic and with it the shift from giving to schools to giving to nonprofit organizations can be seen as productive conditions. They are conditions that produce the outcome that continues even after the permissive conditions such as PISA become less important (Capoccia & Kelemen, 2007, p. 348; Soifer, 2012, pp. 1574-1577). Here, the outcome is that companies and their foundations are actively giving to education outside of the vocational education system in which they have always been active. In this role, they see the need to challenge the state about the education system, to advocate for reforms, to set-up institutions to work in general education.

While some pointed to new levels of coordination among corporations and their foundations in the initiatives mentioned above, others said that they were often too focused on having their own ways to innovate. According to GI2M “There is a stronger belief that you need to be an innovator, that you need to have your own model projects, that you do not just give money for something that is already running” (Line 151). GI1M also added to that saying “so there are 100, or 1000, or 2000, or 10,000 initiatives doing educational work in Munich, Stuttgart, Frankfurt and Hamburg, and they're not cooperating, so there is no knowledge management and there is no transferring functioning projects for other, from Munich to Hamburg” (Line 113).

The combination of companies being more active and listened to in education debates along with partnering with companies, industry associations, sometimes other foundations and the development of new NPOs created the mechanism of reproduction or the way the outcome is able to continue after the critical juncture (Soifer, 2012, pp. 1574-1577). In this sense all of these new connections, new institutions, and interactions allowed corporate philanthropy to continue to be active in general education, outside of their traditional role in dual vocational training, even after the PISA shock was over.

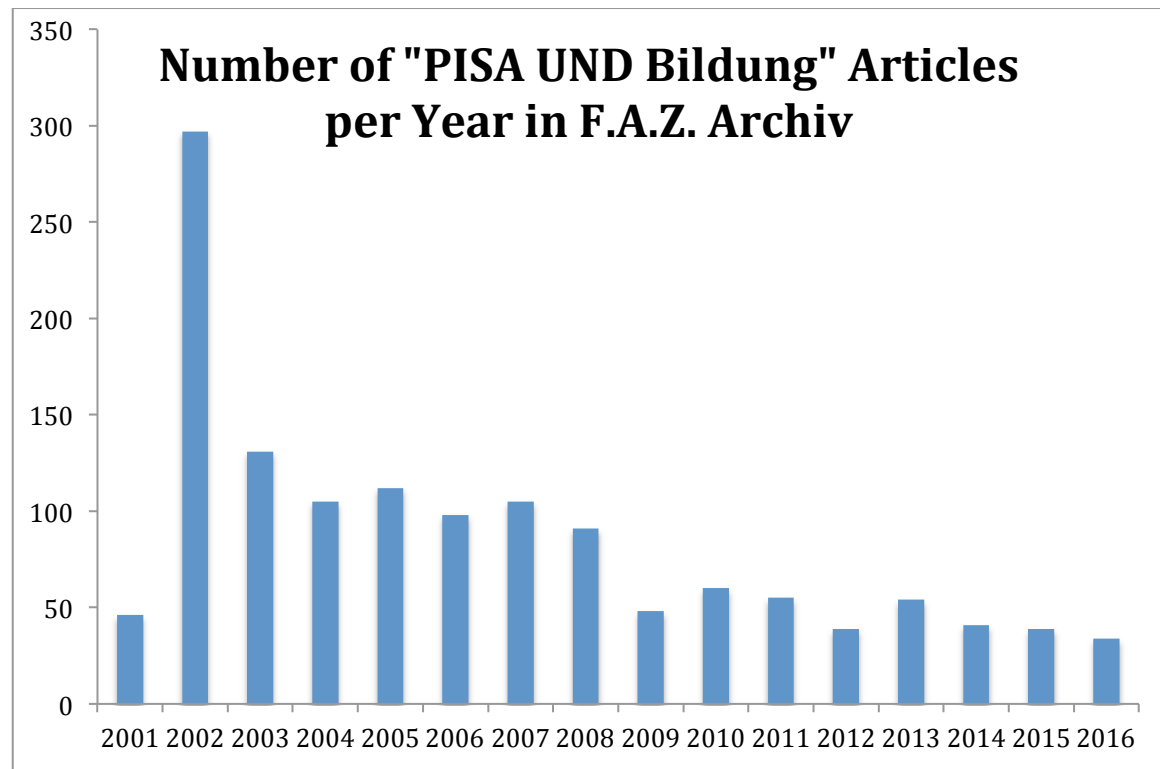
It can also be thought of as an example of increasing returns (Pierson, 2000). In this sense, once corporate philanthropy had built all of these relationships and an institution of investing in general education, they would be unlikely to simply turn around and quit building on these relationships but that this would open the door for continued involvement in education from a philanthropic perspective.

Interestingly when asked when the effects of the PISA shock ended for corporate engagement in education, none of the experts could not name a timeframe. Some argued that each time PISA results are released, they relived the shock again or similarly that with the resulting increase in testing in Germany, there is an ongoing cycle of results and reactions (GI2M, Line 198; GI3F, Line 50). One expert said that she could not name to time frame exactly but that as the PISA results got better the big concern calmed down, even though there is still clearly a need for action (GI6F, Line 172).

Although the experts could point to no clear end date, research using the online archives of the *Frankfurter Allgemeine Zeitung*⁵⁹ for each year from 2001 through 2016 revealed a potential end point to be somewhere between 2008 and 2009 with the number of articles about “PISA and Education” falling from roughly 100 per year to 50 (Figure 6.2).

⁵⁹ One of the most widely-read newspapers in Germany

FIGURE 6.2: NUMBER OF PISA AND EDUCATION ARTICLES PER YEAR



Source: F.A.Z. Archiv (Online), accessed June 28, 2017⁶⁰, own graphic representation

Adding an end date for the critical juncture at about 2009, would complete all of the elements of the critical juncture and leads to the conclusion that in Germany, PISA represented a critical juncture for the way companies engaged in education resulting in a path focused on general education as well.

In the context of a critical juncture, it is also important to consider divergence. According to Slater and Simmons (2010) and Soifer (2012) it is necessary to ask what was happening before and after the critical juncture. Before PISA most companies were not very active in general education issues but instead played their traditional role of participating in the dual vocational training system. For the few who were active in general education, it was more of charity giving to school booster clubs. After PISA, companies were still active in vocational education; however, PISA opened the door for many more of them to become active in general education and the debates that surrounded it in an effort to address the concerns they had about the

⁶⁰ Search terms “PISA UND Bildung,” for 01.01 through 31.12 of each year at <https://fazarchiv.faz.net/>

future of the workforce. This is a notable divergence because it represents a completely new branch of participation and influence in education for companies.

To sum it up, the PISA shock was a critical juncture for the role companies played in education in Germany (see table below with elements). Companies started to be active and invest in general education through corporate philanthropy, not just through the dual vocational training model; which represents a significant divergence. In addition, their corporate philanthropy became more strategic and focused increasingly on NPOs, laying the groundwork for further participation.

TABLE 6.6: CRITICAL JUNCTURE ELEMENTS IN GERMANY

Element	Germany Hypothesis	Germany Results
Critical Antecedent	Decrease in high quality dual vocational training candidates	Confirmed by Expert Interviews and Data
Permissive Condition	PISA Shock- education players. CSR movement and growth in foundations.	Confirmed by Expert Interviews and Data but also a new willingness for schools to work with corporations
Productive Condition	Increase in new corporate foundations funding education and movement towards impact-based funding	Confirmed by Expert Interviews and Data but with the caveat that many of them strive to be strategic even if many of them are not
Outcome	More corporations giving to education philanthropically but part of more liberal foundation sector and being active outside of dual vocational training	Confirmed in interviews and by data from secondary literature
End of CJ	Uncertain	About 2008/2009
Mechanism of reproduction	Corporate Philanthropy partner with political elite, other foundations, creation of new NPOs, coalitions for education and others	Corporate philanthropy active in education, funding and creating nonprofits, some are actively working together
Consequence	Corporate Philanthropy actively engaged in general education, opens door for continued involvement	Confirmed in interviews

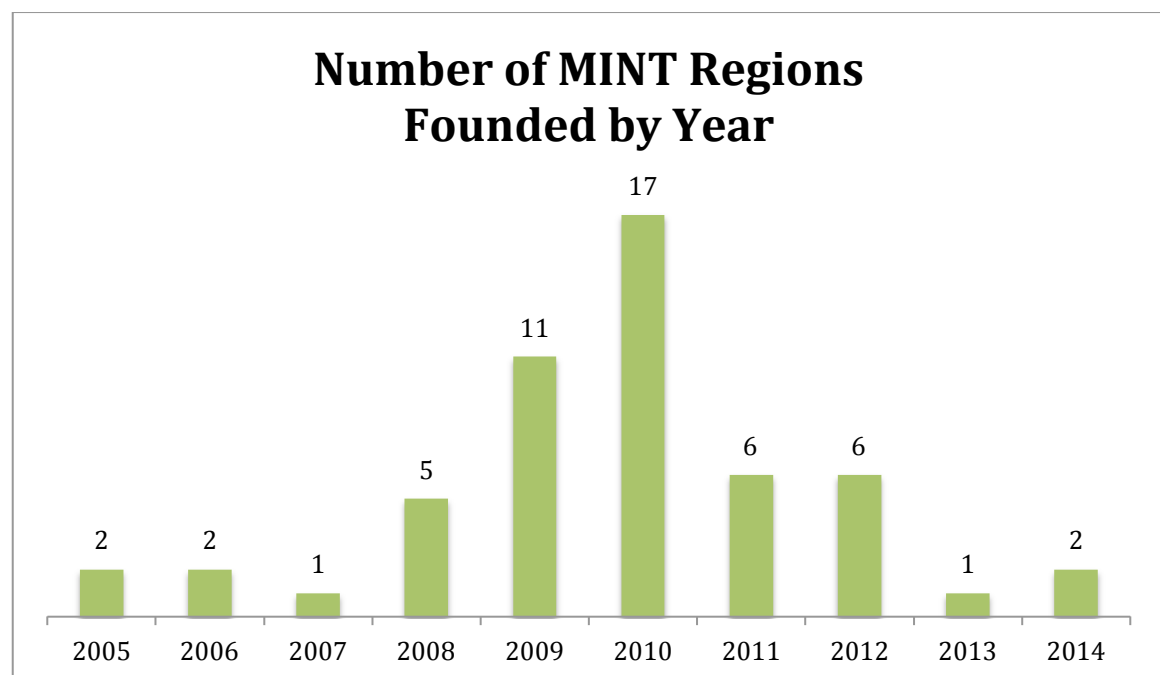
The Rise of a Sub-Policy Paradigm for MINT Education

All of the experts I spoke with said that PISA impacted corporate philanthropy in some way or another- that the sheer shock of it pushed many corporations to act or allowed them to become more active in education. This was also the case for many actors in Germany. It is what some refer to as a “policy paradigm” or a problem definition; which, results when most actors have adopted a common definition of a problem and it is tough to argue with. It changes the way the actors view the world (for definition see: Hall, 1993, p. 279; Mehta, 2013, pp. 18-23). Here the problem definition was our school systems are failing, they are leaving a lot of disadvantaged pupils behind, and our economic competitiveness will decline as a result of this. The time following the PISA shock included new forays into education for corporate philanthropy, which led to new education initiatives and NPOs and at the same time there were increasing pressures for companies to be more strategic in their philanthropic giving (see above). As regards to the development of the MINT education movement on the heels of the PISA shock, understanding the influencers and influencing factors of a policy paradigm is critical to understanding how it formed (Béland, 2007).

Regarding PISA, “one of the key things for the business community definitely was science was not very good, we were not very good in science.” (GI2M, Line 166). If this was clear in 2001 when PISA came out, why did the rise⁶¹ of the MINT education movement not seem to take off until after 2008? The Körber Stiftung collected information on 55 MINT-Regions in Germany and found that 51 percent were founded in the years 2009 and 2010 alone (Rehbach, 2014, pp. 5-6). But why then? Why not earlier?

61 Refers to analysis of a Google and FAZ.net search of “MINT Bildung” for the years between 2001 and 2015. Included in Appendix and mentioned below.

FIGURE 6.3: MINT REGIONS BY THEIR FOUNDING YEAR



Source: (Rehbach, 2014, p. 6)

When asked, most of the experts said that there was a growing worry among corporate leaders about not having enough people with the MINT skills that are so in demand.

TABLE 6.7: CORPORATE INTERESTS IN MINT

“The growth in MINT and MINT discussions is related to a growing lack of people with the skills needed, especially in the MINT areas.” Lines 85 ~**GI3F**

“At this point in time it became clear that Germany did not have enough skilled workers. We had known about the demographic changes but it then became much more significant for the companies- that they would not have the workers with the technical skills they needed.” Line 245 ~**GI5F**

“At least some of them are looking in the further future, and saying, we have to handle this problem now, because in ten years we won't have the people we need.” Line 349 ~**GI2M**

This is what I refer to as a “sub-policy” paradigm as it is a spin-off of the PISA paradigm, which was that the schools were failing, had huge inequities and if not addressed would decrease economic competitiveness. Now came a narrower focus on the education system not producing enough people with sufficient MINT skills and knowledge; which would hurt economic competitiveness. This concept of narrowing is key here and what makes it a sub-policy paradigm. It is not that these corporate philanthropic actors completely changed their stance towards education reform and

policy but they chose to focus their efforts on the MINT areas of it. Or as GI2M put it “I would say in the end for myself this is all culminating and people seeing what happened after PISA and so on and then saying, okay we will take this on in a stronger way (Line 278).

Remember however that part of the definition of a policy paradigm is that actors adopt a common definition to a problem. The definition however relies on the perception of actors as to what the problem is, not necessarily if it really is a problem. Unlike rational choice theories that emphasize that actors behave in ways to maximize their self-interests, ideational theories focus on the construction of the perceived interests of the actors that drive their behavior (Hay, 2011, pp. 72-74). Which raises the question- was Germany really performing terribly in math and science or what drove the interest in MINT around 2008?

As GI5F pointed out, the growth in MINT around 2008 could have been related to PISA 2006, which had a heavy focus on natural sciences (OECD, 2012, p. 23) and the results were released in late 2007. “The results showed that in an international comparison of natural sciences, we were not so bad but that what we were not doing well in Germany was getting young people excited about these subjects and their corresponding careers” (line 250). This is an interesting point because the PISA results of 2006 actually show that Germany was performing statistically significantly above the OECD average in natural sciences, while performing at about the OECD average for both reading and math. Germany still had; however, had some of the largest gaps in performance based on socio-economic status (SES) or in other words, disadvantaged pupils performed far below their more advantaged peers. Even so, the percent of German pupils considered not to have a basic-level of scientific knowledge, was below the OECD average of 19 percent (OECD, 2007b, pp. 2,4). While this was likely no reason to celebrate, on the surface, it certainly does not seem to be a reason for starting a movement for improving MINT education. After all, Germany was performing above the OECD average in the natural sciences and had a lower percent of students below the basic level.

The bigger issue in the PISA results seemed to be that not enough pupils saw the natural sciences as relevant to their lives or something worth pursuing in their future

careers. For example, 48 percent of pupils agreed with the statement “Science is very relevant to me” or 44 percent agreed with the statement “When I leave school there will be many opportunities for me to use science,” compared with the OECD average of 59 and 57 percent respectively (OECD, 2007a; Figure 3.4). This was also raised by GI5F: “then came PISA, which also showed that the science instruction the pupils were receiving was not aligned to anything practical or how it is used in the real world. As a result the corporate foundations and the companies themselves started initiatives to include the more practical aspects of natural science education, but also to the technical education to help to bring these aspects to pupils” (Line 272). This is also an example of corporate philanthropy stepping in to create its own programs in education for subject areas where the state is seen as not providing knowledge and skills that they deem as necessary. This further confirms the findings of Striebing (2017) that 67% of foundations active in education in Germany see themselves as providing what the state is no longer able to deliver (p. 45).

If however as shown above, the science results were actually not that bad, why did corporate philanthropy become so involved in MINT education? It could be that their involvement in the MINT education movement is driven not by actual poor performance in math and science but the perception of poor performance and the big concerns about a dwindling youth population with little interest in science and minimal ties to the “real world.” GI6F acknowledged this by saying “I do not know if the numbers really declined but they were at one time in focus and then there was the thoughts and the concern and out of certain companies that I know that the concern about well qualified future trainees in the MINT fields was really big” (Line 214). This may indicate that some supporters of the MINT education movement think that performance in these subject areas is actually worst than it is. The perception that the performance of German students in science was below average could have influenced companies that are reliant on scientific advancement to invest in MINT education because actors behave in ways to maximize their own interests based on their perceptions (Hay, 2011, pp. 72-74).

When asked about big reports or research that either they remember as being a big driver in the MINT education movement or one known to have a big impact, other than references to PISA no one was able to point to one. This shows that international

influencers did have some effect as the PISA results from the OECD did weigh in on the decision of some companies and their foundations to become involved in the MINT education movement.

The PISA effect on deciding to invest in MINT education specifically was not overwhelming however, as it was only mentioned by a couple of the experts. Although I asked about the affects of international institutions such as the EU, they were not considered to have much influence by the experts, if any. This leaves the MINT movement to be more of a national movement although influenced by the reports of an international organization, it was not considered to be part of a big international movement from the perspective of the experts. Aside from PISA reports, no other research appears to have played an influencing role in the MINT education movement and this is a critical point because I had aimed to learn more about the ways that different types of research units influence the development of ideas especially with the scholarly and party research units that are dominant in Germany (Campbell & Pedersen, 2010; Merai et al., 2011) but it turns out that in this case, there was minimal influence.

The concerns about changing demographics and not having enough skilled-workers however cannot be understated. Each interviewee mentioned demographics at some point or another during the interview, often multiple times but also in relation to MINT.

TABLE 6.8: DEMOGRAPHICS AS A DRIVER

“For the companies, it was obvious that the future pool of skilled workers was declining, especially in the technical areas but also in areas like health care and nursing home care areas. In the technical areas; however it became more obvious that there were not enough future skilled workers.” Line 272 ~**GI5F**

“The MINT discussion is related to the entire discussion around the demographic changes in Germany and the recognition that there will simply be less young people available in the labor market and then overall, the number of graduates in the MINT areas.” Lines 214~**GI6F**

This begs the question of why demographic played such a big role around 2008 in regards to corporate involvement in the MINT movement. The answer may be related to the decline in the number of MINT azubi (nick name for dual apprentices) contracts in 2004 and 2005 in comparison to earlier years, which data was likely

released in 2007.⁶² Overall since 2003 the number of MINT azubis has declined 8.4 percent (Renn & Hiller, 2015, pp. 34-35). It may also be due to the increasing number of training spots that go unfilled each year. In 2009, there were roughly 17,000 training spots that went unfilled, by 2012, there were about 33,000 and by 2014, there were 37,000 (BIBB, 2015, p. 44).

The increased interest seems not to have been related to a BMBF funded initiative “Komm, Mach MINT” aimed at increasing the level of interest of girls in MINT subjects and careers; which was launched in 2008 (Komm mach MINT, n.d.). It appears that the initiative aimed to solve the shortage in MINT workers, given the shrinking size of the youth population, by finding a way to better excite females for MINT careers. Although this initiative had more than 240 partners including companies, foundations, unions, employer associations, universities, and other groups, it was never referenced in any of the expert interviews. This may be due to its narrow focus on women in MINT careers and the minimal requirements to be a member,⁶³ or because the state, not the companies started this initiative.

Interestingly around the same time, MINT Zukunft Schaffen, another network was started by the BDA (Bundesvereinigung der Deutsche Arbeitgeberverbände-Confederation of German Employers' Associations) and the BDI (Bundesverband der Deutschen Industrie, Federation of German Industries). This network of several employer associations, companies, and the Telekom Foundation aimed to create a platform to bring together a critical mass of interested actors to push for reforms to improve the quality of instruction in schools and universities in the MINT subjects. The goal was to excite more students, especially girls, for MINT subjects as a way to significantly increase the number of students active in MINT dual vocational training programs and MINT majors in the universities by 2013, when the initiative was supposed to end (MINT Zukunft Schaffen, 2009a). It was mentioned by two of the experts, GI2M, and GI4M as bringing companies together to push for MINT

62 Even though this actually increased in 2006 and 2007, no one could have known that at the time and they may have seen the increase as a fluke.

63 To be a member, all that was required was a signed memorandum of understanding stating that the organization would support girls/women in MINT education or training in some way or another

education. The point here being that although the state was also involved in creating MINT initiatives, it was not mentioned as having an influence among the experts.

Another driver for corporate involvement in MINT was the need to remain innovative and globally competitive. As GI6F put it “In Germany there is the belief or the conviction that these are also the fields that will really make our country successful in the long-run. We are not rich in natural resources; therefore the question is where/how we can invest and the new technologies are already there. That is why the focus on MINT is important” (Line 289).

When asked about whether or not giving to MINT was related to the trends of declining numbers of pupils applying to take part in dual vocational training programs and the difficulties, the experts had very mixed answers. Some experts explained that MINT education initiatives have been largely aimed at the Gymnasium level or schools serving pupils most likely to go on to college.

TABLE 6.9: MINT AIMED AT GYMNASIUM

“So we have this trend that's social democratic education policy to have more Abituren, so it's always rising, the number is rising, and the number of people we have a lot of chiefs, but not enough Indians.” Line 324// “with the vocational thing, it's always in the shadows, nobody's really caring about it” Line 373 ~**GI1M**

“Only family businesses or mid sized businesses with a strong regional hold, when they go into schools they also think about, where do I get my next apprentice? The rest are focused on more academic endeavors” Line 324 // “they do not cater to what, in the past was Haupt- and Realschule and what now would be Allgemein- and Gesamtschule” Line 358 ~ **GI2M**

With so much concern about not having enough apprentices, why would corporate philanthropy be giving to programs aimed at Gymnasiums instead of those aimed at students in Haupt- or Realschule where students are less likely to qualify to go to university? This is likely due to an evermore-selective dual vocational training market among the larger industrial firms but also the increase in companies, especially the larger companies, that offer dual study programs. These programs are seen as ways to recruit high achieving youth into their vocational programs without losing them to higher education later (Graf, 2013 , pp. 108-116; Jacob & Solga, 2015, pp. 168-169). In other words, they are supporting the schools they hope to benefit from later but their investing provides Gymnasial programs with additional funding opportunities not available to the Haupt- and Realschule. While some of the experts have said that

MINT education initiatives are aimed at helping students from disadvantaged families or those with a migration background, this opens the question if investing in these initiatives at the Gymnasium level is the best way to go about this. Programs aimed at helping students from disadvantaged backgrounds to be more successful would of course meet this goal but generally, based on the lower percentage of these students in Gymnasias, it is not.

Other experts said that vocational education initiatives were also addressed by company philanthropic MINT activities. “We address all types of education, including vocational education. It depends of course on the type of job. Obviously if someone is training to become a baker, they will need some MINT but not so much” (GI3F, Line 99). Another expert explained the connection as “Our social engagement is very much tied to our Ausbildung⁶⁴ activities and I think we are representative of other companies. Perhaps I can also say that the activities in vocational education are also integrations measures or support people to prepare for vocational training. Because of these facts, there are always some vocational training positions where there is a need in Germany for more young people. I think some of these vocational education preparation and integration programs that are supported are also focused on MINT fields. From my perspective, what is fully logical because it gives young people good chances” (GI6F, Line 259).

According to GI3F, “Dual vocational training is a special case of the responsibility, through which the company is strengthened. Many foundations concern themselves with education in the steps before and after so dual vocational training has almost nothing to do with philanthropy” (Line 71). Taken together with the statement from GI6F from above, the point is that corporate philanthropy is sometimes used to help interest or prepare young people for dual vocational education.

The idea of companies choosing to fund MINT education that was aimed at vocational education or aimed at academic education was a false dichotomy however for GI4M. “At the end, even the demographic shifts, we have too little for both. In the moment our actual numbers show that the demand in the academics will grow from 60,000 to 250,000 to the end, at the gap, at the end of the decade but in the

⁶⁴ Ausbildung is the German word for training and in this context vocational training.

professional⁶⁵ sector it will grow from roughly 17,000 to over one million” (GIM4, Line 151). An analysis of MINT jobs across Germany shows that the current situation is worst than what GIM4 indicated with about 265,000 nonacademic and 100,000 academic MINT jobs that went unfilled in 2015 (Institut der deutschen Wirtschaft Köln, 2015, pp. 44-45). According to GIM4; however, industry has been adjusting well by having more students go on to dual study programs. In this way, companies are getting the people they need and the market is also getting the workers needed with both academic and vocational skills (Line 40). The number of students enrolled in dual study programs has more than doubled between 2004 and 2014 going from about 41,000 to about 95,000 students (BIBB, 2014, p. 12). Only time will tell if this change will satisfy the employment market.

The big take-away here is that regardless of the vocational or academic nature of MINT initiatives, the main driver behind their interest in education is a concern about having enough qualified workers. Again, demographics play a leading role throughout. This also shows that my initial hypothesis that corporate philanthropy would not address vocational education because they did not need to was wrong. In addition to the funding general education, some companies do fund vocational education initiatives but it is not often the focus of MINT philanthropic initiatives and it is aimed at raising interest and better preparing youth for it.

Obviously companies were not only engaging in the MINT education movement to address their concerns about having qualified workers. Just as in the decades prior, companies and their associations were working on several fronts to address their needs for a qualified workforce. This is reflected in the changes made to the Vocational Training Act of 1969, which was amended in 2005 (see historical chapter). The changes were made with goals of making the vocational system more: accessible to disadvantaged students, attractive to higher performing students, and overall, more flexible (BIBB, 2005).

The Ausbildungspakt (Training Pact) and the Allianz für Aus- und Weiterbildung (Alliance for Training and Continuing Education) that followed it are also examples of how industry was working with several other actors to address their workforce

65 Throughout the interview GIM4 referred to vocational as professional.

needs and the training opportunities of youth. Interestingly though, the original pact of 2004 focused on industry creating more available slots for azubis based on a concern of not having enough available spots and therefore having too many pupils ending up in the transition system. The later edition in 2010; however, was concerned with the decline in the number of school pupils and not having enough for the workforce. It focused on attracting more pupils to dual vocational training programs, especially those with an immigrant background. In 2014, the pact included even more actors and was renamed. The new Allianz had a new goal of strengthening vocational education, especially the dual vocational training programs and to support the value of vocational and academic education as equal. Another goal included improving the career advising in schools in an effort to help address the “matching” problem between selected careers and industry needs (Busemeyer, 2015, pp. 2-3). The continuing work of the companies and their associations on vocational education is also likely a reason why they do not invest as heavily in MINT vocational education: they have more influence in their current roles in vocational education.

The start of the MINT education movement also coincided with an increasing movement within corporate philanthropy to align their giving to their areas of expertise. For some companies the decision to fund MINT was related to the competencies and legitimacy they could bring. Research about the way foundations describe their involvement in education came to a similar conclusion about their legitimacy. More specifically, legitimacy is dependent upon societal acceptance of the foundation’s work in the education field and that only those seen as legitimate have a chance to influence the discourse in education (Kolleck et al., 2015, pp. 803-804). Corporate philanthropy needs to be seen as legitimate across many stakeholders including the company itself and its shareholders, among other companies and foundations, and the many actors in society active in the sector of interest (Himmelstein, 1997, pp. 3-6). As described by the experts below, the companies and their foundations are active in MINT because the companies are economic leaders in these fields, so it makes sense for them to be involved.

TABLE 6.10: CORPORATE PHILANTHROPY ALIGNED TO EXPERTISE

“I think MINT is a higher-level kind of strategy, so it's not very widespread. It's acceptable for companies who are very near to it.” Line 36 ~GIIM

“It makes sense, especially for a parent firm like ours that depends on people with strong science skills.” ~GI3F

“We have more of a focus on supporting MINT, mostly because we are a chemical company and we bring our own competencies and we’d like to make them available to the education system.” Line 20 ~GI6F

As GI2M poetically stated “in the end this is about giving more than just money but as we say ‘time, talent, treasure, trust, ties.’ And the company definitely can bring I feel a lot of other stuff into the debate” (Line 382). He also pointed out that “the whole emergence of strategic philanthropy, and everything is always 5 to 10 years later in Europe or in Germany than in the U. S., but for sure by now everybody also has heard the buzz words strategic philanthropy and I would agree whether they have been strategic is a different animal or a different discussion, but they all started to develop deeper thinking about how we actually can have influence on certain political issues, on educational issues, how can we be innovative and through innovations have an influence on the education debate, how can we be conveners, bring people together, so again, the extension of the tool box is definitely another trend” (Line 110). GI6F also mentioned this trend but in the context of Phineo, a consulting group that works with nonprofits, but has also worked with corporate philanthropy to try to get better view of exactly what they are giving money out for and how they can optimize resources for the greatest effects (Line 65).

Taken together, this shows that there were also philanthropic influencers such as philanthropy advisors, the parent companies themselves, or even society at large expecting companies to demonstrate more CSR and to be more strategic in their giving. This aligns with Matten and Moon’s theory about “explicit” CSR gaining traction across Europe because of a reduction in their traditional “implicit” roles, such as providing vocational education (Matten & Moon, 2008, pp. 407, 415-417). With Germany’s traditional system of corporate involvement in dual vocational training in decline, explicit CSR initiatives in MINT education are seen as a way to continue to be helpful in educating the next generation. Much like what was happening with the venture philanthropy and strategic philanthropy movements within general philanthropy (Adloff, 2010, p. 413; Mair & Hehenberger, 2014), corporate philanthropy was also facing a push to be more strategic, involved in projects, aligned to their areas of expertise, and outcomes-focused.

To sum up the influencing ideas and influencers: corporate philanthropic actors active in MINT education were influenced by ideas from many directions. The concerns about a dwindling youth population, a need for more skilled workers, and the need to maintain a competitive economy among parent companies were driving influencers for companies to become active in MINT. The reports from the PISA assessments and the perception that Germany's performance in science was poor also drove companies and their foundations to become more involved. Lastly, investing in MINT education was seen as a way to adapt to the idea that companies should be giving back to society but in a way that involved their competencies and built on their legitimacy. The next question is how corporate philanthropy crystalized all of these ideas into a movement.

Bringing people together is a key aspect of a policy paradigm. In this case, the sub-policy paradigm of the need for more and better MINT education brought together actors who may have been loosely associated before.

TABLE 6.11: MINT BROUGHT ACTORS TOGETHER

“Organizations that may have not been supporting the M in MINT came together with those supporting the T.” Line 124 ~ GI3F	
“people working together much more collaboratively across MINT regions and became much more interlinked through communications initiatives.” Line 80 ~ GI5F	
“It is a sign that there is a problem, that we have as a result pulled together the people that have an interest in supporting initiatives under the MINT area” Line 356 ~ GI6F	

All experts interviewed saw the acronym MINT itself is seen as creating a common brand or umbrella, a way to change the discourse from what may be lengthy words and concepts (just think of the word Naturwissenschaften and that is just the N!) to a united one syllable movement. Some experts however, noted that although they are united by this common interest, they are not necessarily working together.

TABLE 6.12: MINT AS AN UMBRELLA

“MINT is like a big umbrella. We now have a bigger voice and lobby together. 125.” Line 36 ~ GI4M	Umbrella Function
“I think it helped to bring many initiatives in Germany together under the topic of supporting MINT.” Line 305 ~ GI6F	
“MINT may have created brand but they are not cooperating.” Line 457~ GI1M	United but not cooperating

“Yeah, it’s an umbrella, it gives them a lobby but in detail some of them have very different interests.” Line 407 ~GI2M

At least two of the experts mentioned MINT as a way to have a common lobby. A great example of this is the Nationales MINT Forum. With more than 30 professional associations, higher education alliances, foundations, and scientific research institutions, the Forum sees its responsibilities as supporting MINT education at all levels of education, from early childhood through school, vocational education, university and beyond to life long learning (Nationales MINT Forum, 2014). One could say that this group has been fairly successful at this. The keynote speaker at the 2016 Nationales MINT Forum was a woman with a doctorate in physics: Chancellor Angela Merkel. When she spoke, she mentioned many of the same points the Forum has been making for years including concerns about demographics, the workforce, and the long-term impacts on innovation. She even mentioned how much the movement had grown, the many actors involved, and said that she was thankful for the Forum (Merkel, 2016).

Referring to a common lobby also indicates a belief that the state needs to intervene in MINT education initiatives and that they need to come together to push on the state to do more in the area of MINT education. This shows that they believe the state needs to act but with a narrower focus on MINT related subject areas, not reforms aimed at generally improving education that were the focus area of large business associations and many foundations immediately after the PISA shock. According to Daigneault (2015), changing beliefs about the problem that needs to be addressed through public intervention is an element of a policy paradigm (pp. 50-53).

When asked about groups or other organizations that were against the MINT education movement, none of the experts could name one. GI2M mentioned teacher unions being critical of anything companies do with schools but never said that they were actually against MINT. In fact, the Deutscher Lehrerverband and several other teacher associations have a position paper about MINT education that also emphasizes the importance of MINT education to several aspects of society but also the economy and the long-run ability of Germany to be innovative. They support “the development of a cross-state strategy and MINT campaign to improve the visibility

and status of the MINT related professions” (Lehrer Forum MINT, 2014). What almost experts did mention, however were the desires of some actors to see other subject areas such as history, political science, or the arts or a bigger focus on vocational education included in the movement or wanting to piggy back on the popularity of the movement. According to GI5F, many of the companies support these other subject areas but “not to the degree they do for things related to securing future skilled workers” (Lines 395).

TABLE 6.13: MINT UNOPPOSED BUT TOO NARROW

“(some in education politics say) I wish there would be other subjects that would have so much of a lobby. I wish there would be others that, I don't know, well let's give money to history or let's give money to political science, or to German.” Line 411~**GI2M**

“No one opposes it but...They want to widen it to make it “MIND” for example.” Line 128// Kultural Bildung does not have this type of set up and wants to be in the action.” Line 130 ~**GI3F**

“there are people who would like to include other foci for example philosophy and art and music.” Line 393~**GI5F**

“No one opposes MINT.” Line 107// “but Probably some people would say that the focus should be much more on professional education on the apprenticeship system.” Line 109 ~**GI4M**

The same lack of opposing views to the need for more and better MINT education could also be seen in the proposals for addressing MINT education from the governing coalition parties CDU/CSU and SPD and those from some members of an opposition party, the Green party. They both explain the need to excite more students for MINT subjects, especially with the changing economy and focus on digitalization (Bündis 90/Die Grünen, 2017; CDU/CSU/SPD, 2017). Unlike thornier policy areas such as teacher tenure (Beamte Status) or all day schools (Ganztagsschulen), MINT does not have a hardened opposition and as a result, the corporate philanthropic actors likely see this giving as more solidaristic in nature (Adloff, 2010, p. 417; Mauss, 2011 [1954, 1925]).

Corporations and their foundations came together around the idea of the need for more people with better levels of skills and knowledge in science, math, and technology, a need for the German economy as a whole but also a huge need for the companies themselves. By framing it in this way many actors were brought together, how closely together is debatable, but together under the umbrella of MINT. It has developed into an assumed problem definition with little to no dissent. The question is

not “do we need more or better MINT education,” rather, “how do we best go about fixing it.” Even one of the teachers’ unions joined the charge and had its own MINT initiatives. This is another key part of a sub-policy paradigm. But just as with a regular policy paradigm, some groups were left out, namely those who argue for more support for arts education or better German language instruction for example. “In sum, once crystallized, a new paradigm not only delimits policy options to conform to that paradigm but restructures the political landscape around an issue, raises the agenda status of the issue, and changes the players involved, their standing to speak, and the venue in which the issue is debated” (Daigneault, 2015, pp. 50-53; Mehta, 2013, pp. 19-20, quote p. 23).

While there is widespread agreement that MINT education needs to be improved, there is also significant agreement about what needs to be done to do so. First in line is improving teacher quality as it related to MINT. This includes teacher training at the universities but also professional development for current teachers in an effort to make MINT related lessons interesting, engaging, and up-to-date. Another common goal is to increase access to MINT courses or in some cases even to require more MINT courses of all students but especially for students from disadvantaged backgrounds and girls. There is also a common goal of exposing students to more MINT careers at an earlier age to pique their interest and to offering more MINT experiences at the preschool level. There are some differences with some organizations pushing more digital efforts, or some focusing on an area of MINT such as engineering more than biology, and others focusing more on how MINT fits within an education experience all together but in general, there is much agreement on the policies that they perceive as a way to improve MINT education outcomes (Bündis 90/Die Grünen, 2017; CDU/CSU/SPD, 2017; Lehrer Forum MINT, 2014; MINT Zukunft Schaffen, 2009a; Nationales MINT Forum, 2014).

This is a noted shift from the more general focus immediately following PISA; which called for improving the schools overall and emphasized improving teacher quality, improving opportunities for students from disadvantaged families, and early education but from more of an overall perspective (Raidt, 2010, pp. 96-98), not just for MINT related subjects. This shift in the concepts of the policy goals among corporate philanthropic actors between the early 2000s and 2009 is an element of a

policy paradigm (Daigneault, 2015, pp. 50-53) or as I argue a sub-policy paradigm. The policy goals and related ideas have not completely changed, they have just become narrower.

In leaning on Daigneault (2015) theory about the necessary elements for a policy paradigm, I argue that the MINT education movement has all of the requirements of a sub-policy paradigm. I have summarized the elements that were discussed in the table below but just as a critical juncture should result in divergence; actual policy changes need to be shown to prove a sub-policy paradigm. The changes may include new laws, statutes, guidelines, or even smaller changes (pp. 50-53). This will be addressed in the next section where I show that there were indeed some changes, although small, that led to some increased funding and additional calls for funding and new initiatives among policymakers. So, in sum, there was a sub-policy paradigm but the resulting policy changes were relatively minimal.

TABLE 6.14: POLICY PARADIGM ELEMENTS IN GERMANY

Element	Early 2000s	~2009 and onwards
Ideas about the current state of the problem and the role of the state	Concerned about general education after PISA and wanted to act because they did not believe the state alone could sufficiently address the issue	Have an assumed problem definition that MINT education is lacking and the state needs to act to ensure enough skilled workers and a competitive economy
Belief that the problem requires some type of public intervention	Was a huge outcry about PISA with many companies and their foundations advocating for education policy reforms	Belief among some corporate philanthropic actors and others that improving MINT education needs public intervention to propel it forward
Concepts of policy goals that should be pursued	Policy goals included improving academic performance overall but especially for disadvantaged groups	Policy goals included improving MINT education and offering more of it, especially for underrepresented students
Ideas about how to achieve the goals through policy	Better teachers, more support for students from disadvantaged backgrounds	Better-prepared MINT Teachers, more opportunities for underrepresented students, and better ties to industry

Beyond the Idea of MINT Education

The creation of the sub-policy paradigm of the need for more and better MINT education needed be followed up with actions such as bringing people together and attempting to drive additional resources towards MINT education. The question is if corporations and their foundations are simply a part of the movement or playing a lead role and if that has resulted in any policy changes or additional funding that benefits MINT education.

Leaning on Ekkehard Thümmler's (2014) research, which is based on DiMaggio's theory on institutional entrepreneurs, the three components of institutional entrepreneurship are addressed; mobilizing resources, developing discursive strategies, and bringing together new groupings of stakeholders (see also: DiMaggio, 1988, pp. 14-16; Leca et al., 2008).

In their discursive strategies, institutional entrepreneurs try to frame the problem, develop a common language, and raise awareness of the issues and possible solutions (Leca et al., 2008, pp. 11-14), which are also common to advocacy work (Clark, 2010, pp. 12-15; Leca et al., 2008, pp. 11-14). As demonstrated in the section about the sub-policy paradigm, the problem has clearly been framed as MINT education not being abundant or satisfactory enough. The common language to use is "MINT" and the need to improve it. This is a shift from earlier times when people would have spoken of the different subject areas separately or would have grouped them together as math and science and would have used some long words and sentences to describe their concern or area of interest. Now it is summed up with "MINT." This despite the fact that the M in MINT does not face the same problems as T, as in schools may have enough math courses but not enough of an emphasis on technology. As noted above, they also have proposed potential solutions including improving teacher quality, more MINT educational opportunities for disadvantaged students, earlier exposure to MINT careers, and MINT in early education. The questions are if corporate philanthropy is actually leading the band or if it is just a member and if it has been successful in bringing awareness to the issue.

According to the experts interviewed, corporations and their foundations are leading or partially leading the MINT education movement (see Table 6.15). For some of the experts, it was clear that companies were the drivers of this because of their needs for more skilled workers. For others, they share the space with organizations that represent companies and have a stronger political presence. For others, they are leaders in one area such as early childhood MINT initiatives but they share the leadership role with the teachers and others general school MINT initiatives. The Telekom and Siemens foundations, as well as the company BASF, were mentioned by some of the experts as leading corporate philanthropic actors in the MINT movement (GI1M, GI2M, GI5F). This coincides with the finding that in the MINT regions across Germany, aside from schools, the most common actor across the regions were the companies with 93 percent of the regions reporting them as actors and the industry associations, active in 86 percent of the regions (Mayer et al., 2014, p. 5).

TABLE 6.15: CORPORATE PHILANTHROPY LEADING THE WAY

“Yes so it is exactly the companies that have the strongest interest in Germany. These companies support MINT in a variety of ways. Through their foundations, through societal politics but also directly where they are working with a view towards skilled workers.” Lines 448 ~ GI5F	Corporate Philanthropy in the Lead
“Yes, I would say yes. They are out front from the sense that they are the ones that are pushing this theme forward. There is also the need to always make it even clearer that the companies are the drivers of this because their situation demands it- because of the demographic developments and the requirement of future trainees in Germany in these fields requires it.” Lines 341 ~ GI6F	
“Yeah, they are on the forefront, but they are on the forefront when it comes to the business side together with BDI and the Handwerkskammern and so on because in the end they all also have education departments and actually they really are the ones that influence from the business side education policy. Line 458 ~ GI2M	Corporate Philanthropy Partially in the Lead
“At the early education level, they are leading the way. 138 ~ GI3F	

GI4M argued however that while corporations and their foundations are leading the way, there is a difference in the way they are approaching this with corporate foundations going after niche areas and the companies going after places where they saw gaps in preparation. “Some of the foundations are very political animals in this country. They usually look for the niche, but niche is not professional education in MINT. The niche for our time was education in kindergarten or the niche was MINT education for the senior group of people. The focus was not necessarily technical

informatics but was more on science and math, so lets say the business tackled where it had gaps and the foundations tackled where they saw niches” (Line 178).

He went further to argue that for many of the big companies, their activities in MINT could not even be considered philanthropic but that “some businesses have hundreds of thousands of MINT apprentices overall, so it’s a very normal activity for them to market, to communicate, to recruit and to bond. That is not, you know, the US companies don’t have apprenticeship systems, so for them everything is philanthropy” (Line 199). This is an important distinction as it highlights the difference in actions in MINT in the two countries: that in Germany only sometimes is it philanthropic but in the U.S., it is all done through philanthropy because there is no other way.

In a related remark, GIIM said “When you look at the companies that are in the Forum, it is Telekom, it is Siemens, BASF has a role in there, and some others. There's a Verband (association) in there, but the big general foundations are very much not a part of this, which is what makes it truly more of a corporate philanthropic endeavor” (Line 353).

A key trait of institutional entrepreneurs is the ability to bring together groups of actors (DiMaggio, 1988, pp. 14-16; Thümler, 2014). While it was clear that the MINT sub-policy paradigm brought actors together (see section above), the question here is if corporate philanthropy was the one bringing the actors together and leading the charge. In this case companies and their foundations are in the driver seat of this movement and they are involved in many initiatives throughout Germany. They are bringing together many actors from many different backgrounds and with many different interests with the agenda of improving and increasing the access to MINT education in an effort to have enough qualified workers and for Germany to remain economically competitive. Companies and their foundations are able to bring actors and organizations together by aligning their giving to improving their competitiveness, or at least in ways they perceive will improve their competitiveness; which aligns with the assertions of Porter and Kramer (2002) that companies are in a unique position to do so because of their ability to identify potential grantees and other funders and bring them together. In the case of funding MINT education initiatives,

their ongoing work in finding suitable dual vocational trainees gives them even more leverage.

That companies and their foundations are leading the MINT education movement is in contrast to Striebing (2017) finding that German foundations rarely steer the agenda of the state with regards to education but that the state sets goals and then seeks partners (pp. 96-101). While that may be the case for philanthropy in general, I argue here that corporate philanthropy, with its natural ties to industry and industry associations and its interest in improving specific education outcomes is doing more to steer the policy goals and to seek partners. There is no doubt that they also work with the state but in the interviews state actors were never mentioned as playing a leading role in the MINT movement nor were any state-initiated MINT endeavors such as “komm mach MINT.”

Part of playing a leading role in the MINT movement includes the ability of corporate philanthropy to raise awareness of the perceived educational deficiencies. When asked if they felt corporate philanthropy was doing this the experts agreed that they were.

TABLE 6.16: BRINGING AWARENESS TO GOVERNMENT

“Yes, we have a big focus on communications about MINT. We have the MINT Forum with exactly this in mind. Reports and communication are key.” Line 145~**G13F**

“Yes, so the companies but also us, we are an industry organization. Our member organizations are informed about the MINT needs at their full meetings by their members, they bring this to the parent organization. Based on this, we do what we can to make the politicians aware. So long as that works through these institutions- that is how it works in Germany, through the associations and that is also lobbying.” Line 469 ~**G15F**

“Yes, I think because through that, overall many different actors have played a role but for this topic from my perspective, many more people have become very aware and have become more active in education.” Line 351 ~**G16F**

It appears that MINT education has definitely risen in awareness. In both a Google and a FAZ.net⁶⁶ archive search of “MINT Bildung,” there was evidence of a large increase in articles including the term. For example in the three years between 2005 and 2008, there were just 2 articles in the FAZ.net archives pertaining to “MINT Bildung.” From 2008 through 2010, however, there were 22, and for each of the

⁶⁶ FAZ refers to widely read newspaper in Germany- Frankfurter Allgemeine Zeitung

following years at least 10 articles. The Google search revealed just 22 articles between 2005 and 2008, 69 in 2008-2010, and an increase in the number each year so that in 2015, there were 452 articles with a mention of “MINT Bildung” (based on research of the author, see appendix for details).

GI4M also expressed concern that “Government is aware of the issues but this does not mean that they are actually doing something about it” (Line 236). Getting government to “do something about it,” however, is one of the elements of institutional entrepreneurs- they mobilize resources to channel public policy budgets in new directions. When asked if there were any MINT initiatives that were founded by corporate philanthropy but were now state-financed or at least partially state-financed, all experts except one went on to name specific initiatives. The initiative that received the most mentions was Haus der kleinen Forscher. When she addressed the Nationales MINT Forum, Dr. Angela Merkel mentioned that her administration was cooperating with many MINT initiatives. As an example, she too mentioned Haus der kleinen Forscher. She was careful though to add that although education is a state-level right, at the federal-level she is limited in what she can influence but that things like teacher training were on the table (Merkel, 2016).

TABLE 6.17: STATE FINANCED MINT EDUCATION INITIATIVES

“The Kindergarten program (refers to Haus der kleiner Forscher) has been scaled dramatically. I don't know how much public funding is involved in that, but it has scaled. I think the, Wissensfabrik has found an interesting way to scale its curriculum approaches, and definitely some of the Telekom work on quality criteria for certain MINT subjects and so on had a strong policy influence.” Line 484 ~**GI2M**

“Yes, Haus der kleinen Forscher. Now it has government funding.” Line 151~**GI3F**

“ZDI is a center where youth can go in their free time and can go try things out. They are financed directly by the state of NRW. That is the strongest example of state financing in MINT. It is called Zukunft durch Innovation. It is a network and there is also involvement from companies and the chambers support that too but it is really a community program for MINT youth but the centers themselves were funded by the state of NRW.” Line 503// “And Haus der kleinen Forscher- that was started from foundations and then the education ministry (BMBF) now also gives and so it is strongly supported by the state.” Line 519~**GI5F**

While awareness for MINT education at the federal level has increased and there are countless initiatives across Germany, it was not until the beginning of 2017 that the Bundestag (German National Parliament) had it's first hearing regarding MINT education, with the governing coalition parties putting forward a proposal for how best to support and further develop MINT education programs. In this proposal there

was also a list of the programs the government was also currently funding. While there were some initiatives on the list, several of them appeared to be existing projects; which had a MINT component or focus added to them later on. The projects listed were mainly funded by the BMBF (Education and Research Ministry) and included funding in the double-digit millions over a set number of years. For example, the supplemental funding of Haus der kleinen Forscher received eight million Euro between 2012 and 2015. Also, a new program aimed at helping women to be successful in MINT-related jobs would receive up to 12 million Euro between 2017 and 2020. The proposal also noted that there was a lack of a strategic plan for addressing MINT education and put forth suggestions for creating a plan and ensuring investments in MINT were complementary and not duplicative (CDU/CSU/SPD, 2017). The proposal notes that the one thing all of the MINT-regions have in common is the support of the policymakers, the administrative bodies, and the regional business communities and that further development of successful models will require supporting and encouraging these networks (CDU/CSU/SPD, 2017, p. 4).

In terms of mobilizing resources and offering solutions, all of the experts could point to projects that had been started by corporate philanthropy and ultimately funded by the state. Although, most pointed to the Haus der kleinen Forscher, there are many other initiatives that have heavy corporate philanthropic involvement and also involvement from the state- or local-level government (see for example: Mayer et al., 2014). As noted above; however, the changes at the federal level have been somewhat minimal. This may be due to the limited role of the federal government in education. Regardless, this marks a shift in the traditional ways that corporations have been active in education through either their dual vocational training programs or through funding school booster clubs. Instead they are leveraging their relatively minimal resources to channel public budgets in new directions in order to cause systemic change in MINT education.

According to Paul DiMaggio (1988) "new institutions arise when organized actors with sufficient resources (*institutional entrepreneurs*) see in them an opportunity to realize interests that they highly value" (p. 14). Just as other scholars have found traditional foundations to have acted as institutional entrepreneurs (see for example: Quinn et al., 2013; Thümler, 2014), I argue that corporate philanthropy is playing this

role in the MINT education movement in Germany. They are bringing together multiple actors behind a single message of improving MINT education, aimed at getting more public funding for this purpose because they truly believe it is in their best interests to have students with the highest MINT knowledge and skill sets possible but with minimal success at the federal level.

Chapter 7: American Findings

Overview

In the United States, there is a long history of corporate philanthropic engagement in K-12 education, especially after the increase in corporate giving in the 1980s and the Nation at Risk report; which resulted in a major focus on education and gave corporations more of a voice in education issues. As noted in the historical chapter; however, there was little to no involvement of corporations in vocational education. I argue that this is changing because the approach of corporate philanthropy is changing to be better aligned with the needs and expertise of the company. The question is if this is right and if so, how and why corporate involvement in K-12 education changed course. To answer this, in this chapter, I analyze why top corporations engaged in education the way they did since 2000, and more recently in STEM education.

NCLB and Corporate Involvement in Education

For American companies heading into the 2000s, after about 20 years of substantial philanthropic investment in K-12 education, there were some serious questions about the investments they had made, the corresponding results, and how to proceed. USI2MF explained, “When I think about the last 25 years, there was for quite some time frustration of the corporate funding community as elsewhere that they were giving away lots of money. I mean it was a drop in the bucket of overall education funding and yet there wasn't a lot of change” (Line 140). They further explained “a number of vocal, influential people in Corporate America who had been saying, ‘We've been spending all this money and where are the engineers? How could it be that things aren't happening?’” (Line 156). According to USI3F, another concern was the lack luster performance of the Annenberg Challenge, which caused not just corporate philanthropy but philanthropy in general to question its approach to funding K-12. She was referring to the results of the Annenberg Challenge of the 1990s which at \$500 million plus matching contributions was the largest donation to American education ever but was seen by many as a failure (Clemens & Lee, 2010; Colvin, 2005; Hess, 2005b; Reckhow, 2013a). These concerns about the results of their investments in K-12 education represent a critical antecedent because they happened before the time of the critical juncture (NCLB) and could combine with other factors

during the critical juncture in a causal way to affect the outcomes (Slater & Simmons, 2010, pp. 888-890; Soifer, 2012, pp. 1574-1577).

Building off the comment of not having enough engineers, which is a specific need, all of the experts mentioned a concern about not having the skillsets needed for the economy as a driving reason behind the changes in corporate involvement in education in the U.S. Again, these concerns raise another critical antecedent, employers were concerned about the future of the workforce and finding enough skilled workers. This concern did not go away during the NCLB time but added to the conditions present to affect the choices corporate philanthropy made regarding their funding of K-12 education.

TABLE 7.1: NOT ENOUGH WORKFORCE READY

“I also think it is where the corporate side of the world has said “ we don’t have jobs for woodmakers,” you know “ we need somebody that can come be on this assembly line for this thing and understand the technical side well enough to read this manual, to fix this thing, to you know, whatever the widget is. So I think that’s why we’ve seen more of the corporate funders fund things like US Robotics and that sort of thing where it has been a little more focused.” Line 197 ~**USI1M**

“The basic message is: we’re not finding the talent and the knowledge that we need. We’ve got jobs that are open, we can’t find people who are qualified or if we can find people who are almost qualified, we have to pay to remediate. So workforce is a very big driver.” Line 43 ~**USI2MF**

“They’ve come to the recognition that unless they engage directly by informing what gets taught, participating in the educational process, they’re not going to get the kind of workers they want.” Lines 77 ~**USI5M**

Many corporations clearly had concerns about not having enough people with the necessary skills. To this end, many business groups supported an increased role of the federal government in education. They preferred the provisions such as standards, tests, and accountability in NCLB because of their long-run concerns for the workforce and a belief that national leadership was needed (DeBray-Pelot & McGuinn, 2009, pp. 23-27; Mehta, 2013, pp. 233-234). According to some experts, once NCLB was signed into law, however and data about how various groups of students were performing in math and reading came to light, corporations and their foundations changed the way they funded education to be more focused on minority populations.

TABLE 7.2: NCLB DATA BROUGHT AWARENESS AND CHANGE

“I feel like, prior to NCLB, if corporations were donating and so forth, it was and I guess it still is to a certain degree, it was around robotics and technology type things. And I feel like it got shifted a little bit to now they’re not funding it in suburban areas, they are funding it in areas of higher need... what NCLB did for us, I think is, is said ‘here is the problem with the leaky pipeline, there’s a bigger problem with not enough kids going into it.’” Line 120/242

~**USI1M**

“I think of how that [NCLB] has fed philanthropy now, is that we were actually able to identify target audiences that you were really trying to improve and change that needle. I think that was incredibly significant on the philanthropic side. As organizations, we’re really trying to address ... If you were trying to address the African American or the Latino population, you now finally had data to say, “Are we moving the needle or not?” Lines 118-123

~**USI4F**

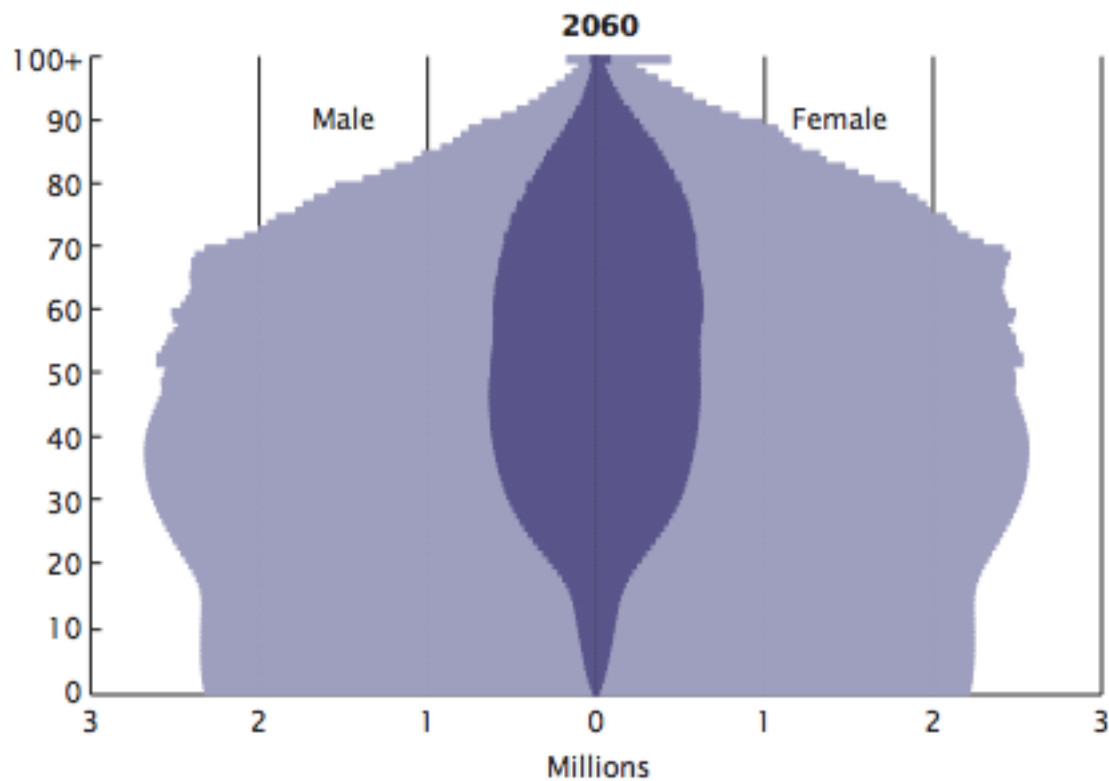
“I feel like before, there were kind of broad notions of how well kids were doing, but with the advent of NCLB looking at different types of kids and how they were doing, I think that the availability of that data and the message it brought resonated with corporations, and the story is compelling. Right? Nobody thinks kids can’t learn because of who they are. We need to act and different organizations are going to respond differently.” Lines 61

~**USI6F**

The ideas that corporations needed to act and that the results of NCLB allowed them to do so in a more concrete way as described by the experts above are very much aligned with the definition of a permissive condition. According to Soifer (2012), permissive conditions change the underlying circumstances in a way that increase the power of agency and the chances to make a change (p. 1574).

Some of the concern related to the performance of different subgroups of students may also be related to the population projections for the United States. In 2014, White, non-Hispanics made up the majority of the population at 62.2 percent. By 2060; however, they will be in the minority with 43.6 percent and the largest growth among the Hispanic population (Colby & Ortman, 2014, p. 9). With the United States becoming a “minority majority” nation, addressing the ethnic and racial disparities in education is no longer a “nice-to-do” but of paramount importance for companies worried about the future of the workforce. This is also significantly different than Germany where the dwindling youth population overall seemed to be the largest demographic concern. While there is a decrease in the size of the youth population compared to the older generations (see Figure 7.1), it is not nearly as pronounced as in Germany (compare with Figure 6.1).

FIGURE 7.1: U.S. POPULATION PROJECTION FOR 2060



Source: U.S. Census Bureau, 2014 National Projections on page 8 of Colby, Sandra L. and Jennifer M. Ortman, Projections of the Size and Composition of the U.S. Population: 2014 to 2060, Current Population Reports, P25-1143, U.S. Census Bureau, Washington, DC, 2014.

The achievement gap revealed by NCLB should not have been any surprise given the results of the National Assessment of Educational Progress (NAEP).⁶⁷ In 2000 for example, 63% of Black and 58% of Hispanic fourth grade students scored below the Basic level in reading compared to 27% of White students (U.S. Department of Education, 2001, pp. 44-45). While this should have raised alarms, NAEP does not come out on a yearly basis and does not actually break the data down to the local level. As a result, it was difficult to assess where best to work to make a difference.

The performance of minorities that was brought to light as a result of NCLB raised a flag for many companies, especially in the demographic context just addressed. As USI2MF put it: “I think what is moving them and is going to move them is the diversity of the workforce. I think that ultimately what it comes down to is that they're really in the CSR business for workforce reasons” (Line 178).

⁶⁷ NAEP is given to a representative sample of students across the United States so although it is called “National” it does not mean that every student in the country takes it.

The availability of data about different subgroups of students as a result of NCLB had an impact on the way corporate philanthropy could engage in education. As a result, there was an increased awareness of the inequalities of the education system.

Companies and their foundations suddenly had more information regarding how they could best target their efforts in ways that aligned with their concerns about having a more diverse workforce. Taken together these permissive conditions (Soifer, 2012) increased the agency of companies wanting to be active in education.

Another permissive condition I did not anticipate was the politicization of education. Companies felt they needed to become more involved in education because it became a hyper-charged issue. This also changed the context in which companies in their foundations were operating. In the past it was not as political but since NCLB, education policy has become much more so and as a result, companies and their foundations felt the need to become more active.

TABLE 7.3: EDUCATION HAS BECOME MORE POLITICAL

“Education has become such a political football here that, I think some companies are realizing that they’ve got to step in or there’s really not going to be a change in education.”

Line 86 ~ USI1M

“I think one of the things that has happened is that education has become more politically and hyper-charged recently.” Line 252 ~ USI2MF

At the same time that the NCLB results started to come out on an annual basis, there were also movements within the philanthropic landscape around the need to be more strategic or in other words to show impact, scalability, and return on investment. All experts asked about major changes in corporate philanthropy mentioned being or wanting to be more strategic and focused on outcomes. To them, being more strategic meant no longer giving money away because it was the right thing to do but to focus on what they wanted to achieve and which outcomes were necessary to prove they had. For some of the experts, corporate philanthropy was already more strategic, for others, they were trying to be strategic but they still had some work to do.

TABLE 7.4: STRATEGIC CORPORATE PHILANTHROPY

“it feels like at least there is a more consistent vision for where a particular company wants to go. I’m not sure they always know how to get there.” Line 53 ~USI1M

"I think a little bit back in the 1990s, some of it might have been a little bit more ... I don't want to say self-serving, but I think it was, "We're doing this because this is what a company should do." I think what you're starting to see now is much more strategic thinking around what are the issues, and how do we participate, and how do we help." Line 96 ~**USI4F**

"One change that's become prominent is a high focus on return on investment. Companies when they give money now expect to see good data, see an impact on what they do, not giving on face anymore." Line 30 ~**USI5M**

"there's interest in looking at results in a more direct way and looking for outcomes" Line 21 ~**USI6F**

For many of these companies, being more strategic meant investing less in schools directly and more in education-related nonprofit organizations. Corporations and their foundations were seeking to have a bigger impact and to be able to show greater scalability. To do this, they invested in nonprofits that could affect a much larger slice of the population.

TABLE 7.5: FUNDING NONPROFITS TO SCALE RESULTS

"If you're making an impact for 500 kids in a school, that might be OK. But I think that more and more, what I've seen anyway is that they are going to nonprofits or organizations, that can have greater interaction with more people." Line 120 ~**USI1M**

"When you went into philanthropy back in the 1990s, I would say it was very school-centric. It was very much, 'I'm going to work with this student population at this particular school.' It was also very isolated. Now that I would honestly say it's shifted, there's still giving to individual schools, but you're also seeing much more focus on metrics and sustainability, and taking it to scale." Line 70~**USI4F**

"I think it comes down to the ability to scale. There's still some major companies that still fund very locally. That's not gone. But, more and more, we see companies looking to leverage their investment. They put some money into a non-profit because they can influence an large number of places." Line 48 ~ **USI5M**

USI3F explained that this shift in funding may be due to the ways schools or school districts operate, which seems to be increasingly at odds with how philanthropy operates: "when you fund a district directly, I mean they have a whole different set of priorities than what a philanthropy has and they need to make the buses run and they have to use their money for daily operations. Often it is very hard for them 'to supplement but not supplant.' The money really just disappears and they cannot move quickly and there are all kinds of barriers. I mean just for us to get on a procurement list in order to be able to contract with a city. It can take a year and it is unbelievable. All for good purposes, which are ethics and transparency but it has gotten increasingly regulated and increasingly hard. Philanthropy has gotten much more revved up and active politically around changing the way schools operate and they are impatient with school bureaucracy. Increasingly they are using intermediaries or

outside organizations” (Line 124). The frustration with the bureaucracy of schools was not something I had expected but is an example of a critical antecedent because it was present before the critical juncture but had an affect on the decisions of companies and their foundations during the critical juncture (Soifer, 2012, pp. 1574-1577). This also aligns with what was happening in general philanthropy as the new leaders in education philanthropy such as the Gates or the Walton foundations also had little patience for the bureaucratic ways of school systems (Hess, 2005b, pp.5-6).

USI3F also explained that part of the decision to “move from funding (schools) directly came from the experiences such as Annenberg and Carnegie” (Line 120). USI2MF explained this further as “I think there was for a time an interest in broader reform strategies [...] Not that a lot of companies did it but there were a number of them that began to do that. Some of the company organizations like Business Roundtable and others were beginning to focus more intently on those kinds of issues. There began to be a sense of writing checks with greater purpose and a greater (say) in what would actually happen with the money that came out of that check.” (Line 139).

Some of the experts, namely those not working in corporations or their foundations also mentioned a reason behind companies having increased involvement or wanting more visibility in K-12 education as being part of “enlightened self-interest” (USI5M, Line 15). Or as USI3F explained “I wanted to say one more thing about corporate philanthropy. Don’t forget, when you are talking about these companies, these are companies where CEOs are making \$3 million in salary and another \$40 million in bonuses. So it gets really embarrassing and that is not how it always was [...]. They are also making salaries that produced exactly what we are seeing right now- take Bernie Sanders on income inequality and corporate pay and Wall Street. So I think in the U.S., there is a very big push around looking like you are a good citizen” (Line 99). This push to look like a good citizen can also be seen as a permissive condition for companies because it likely caused a change in their ability to act philanthropically in the education space or as Soifer (2012) puts it, it increased their power of agency (p. 1574).

Some of the experts also mentioned that companies were looking to align their giving with their areas of expertise. As USI2MF mentioned “to some degree they're trying to define their giving in terms that are very closely and matched to their competency” and “I think there's been an attempt among companies to try to understand where their competency is and to wrap that competency into the solutions they can put on the table” (Lines 193, 212). USI3F mentioned “IBM is an example of a company that went from bringing technology resources to schools to now actually helping to support a school’s model and now actually proselytizing all over the country through their P-tech model” (Line 91).

The increased focus on more strategic philanthropy and philanthropy that was aligned to their competencies as a company can be seen as productive conditions that lead to outcomes that continue beyond the permissive conditions of NCLB data reporting and its results (Soifer, 2012, pp. 1574-1577). The need to show impact, scalability, return on investment, and in some instances to align their giving with the competencies of the company led to corporations and their foundations changing the way they invested in education. Namely, there was a shift from investing in schools directly to increasingly investing in education nonprofit organizations where they felt their leverage would be better and a focus on diversity issues; which can be seen as the outcomes of the critical juncture.

Investing in nonprofits instead of individual local schools also opened the door to more coordination among companies and more partnering around philanthropic endeavors. This cooperation and the investment in nonprofits can be seen as reproductive mechanisms because they laid the groundwork for similar initiatives and alliances later on and potentially for shared projects and initiatives that are aligned to their competencies and needs (Soifer, 2012, pp. 1574-1577).

TABLE 7.6: CORPORATE PHILANTHROPY WORKING TOGETHER

“They’ve been able to coalesce more around in the U.S., things around Common Core or we’re starting to see it more with NGSS [note: Next Generation Science Standards]. You know, so there’s, I think there’s something to rally around.” Line 67 ~**USI1M**

“There's a lot more talk among corporations about sharing ideas and concepts. ---Now, what we're seeing is companies are coming together around an issue.” Lines 77~**USI4F**

“It's still in the early stages, but I would say there's more and more coordination among company philanthropies, putting their money into the same pots. For a long time, each

company sort of took it's own route, still does to some extent. More and more, they're realizing that by vulcanizing their investment like that, they don't get as much of a return.”
Line 48 ~**USI4M**

While NCLB and the data that resulted from it clearly opened the door for companies to be more active in education, many companies were actually not satisfied with what was happening in education as a result of it. They were concerned about a narrowing of the curriculum because of its heavy focus on English and Math and its over-emphasis on testing. Some of the companies and their foundations that initially saw NCLB favorably for the light it shed on the state of education, especially for poor and minority students, became frustrated when some of the skills they valued most were no longer in focus and often dropped from the curriculum.

As USI1M explained “by 2008 NCLB had been in for six years and people had started seeing the narrowing, right so it’s all about math and reading and I think that you started seeing more people, saying there’s got to be a little more balance here. But again, I think the corporate world and organizations like our organization⁶⁸ and some of the other nonprofits that focus on careers started saying ‘hey, I’m not real sure how a kid can just do math and English and think they are going to survive in a technological society’ (Line 219). USI2MF also said something similar “NCLB flies in the face of what most businesses are advocating for” in terms of more hands-on learning with workforce relevance and further said that while corporations were originally on board for NCLB they started to push back against it (Line 286). This can be seen as the end point of the critical juncture, making it about a seven-year timeframe. Defining a specific timeframe with an end for the critical juncture is important because the briefer the juncture with respect to the path of the institution itself, the more critical (Capoccia & Kelemen, 2007, pp. 349-359; Soifer, 2012, pp. 1574-1577).

Although all of the elements of a critical juncture appear to be there (see table 7.7), as Slater and Simmons (2010), Pierson (2004) and Soifer (2012) have noted, it is critical to analyze the divergence in what was happening before and after the critical juncture. In this sense, when one looks at how companies were active in education before: they

68 Name of organization removed to protect anonymity

were investing philanthropically directly in schools and districts with no little to no eye towards impact, scalability or outcomes and they were not collaborating as much. Also due to a lack of data, they were often funding education programs in general but did not have a focus on poor and minority children. Compare this to the consequence of the critical juncture: companies were collaborating more on education initiatives, they were more concentrated on education for disadvantaged students, they were trying to be more strategic and in doing so, shifted some of their investment from schools to education nonprofits, and attempting to align their giving with their competencies as a company. While this is a divergence, it is a minimal divergence, companies were still mainly giving to education via philanthropy like they have been since the 1980s. The difference is in their style of giving and is not an example of a critical juncture.

TABLE 7.7: CRITICAL JUNCTURE ELEMENTS IN U.S.

Element	USA Hypothesis	USA Results
Critical Antecedent	Corporate Philanthropy long involved in education but not seeing results. Also concerns about workforce shortages	Confirmed by expert interviews, became increasingly frustrated with school bureaucracy
Permissive Condition	NCLB- data reporting and increased awareness of inequalities in education and failing schools. Opened the door for more actors. Caused concern about education system	Confirmed by expert interviews and data but also that education had become very politicized. Also noted concern about oversize CEO compensation and needing to have more of a philanthropic footprint
Productive Condition	Shift from old funders to new and their venture approach (i.e.; Gates), competitive advantage philanthropy/aligned with their competencies and needs	Confirmed by expert interviews and data but with caveat that some do not know how to be strategic but they are trying.
Outcome	Shift from funding schools to nonprofits and more national advocacy efforts and more of a focus on diversity	Confirmed in expert interviews
End of CJ	Uncertain	Around 2008 or so, many became frustrated with NCLB

Mechanism of reproduction	Uncertain	More corporate foundations are working together
Consequence	Corporate Philanthropy funding initiatives more aligned to their competencies and needs	Partially Confirmed in interviews- some investing in initiatives aligned to their competencies and needs

Unlike the German case where there was more of a diversion and therefore, a critical juncture, it appears more that this was part of what Streeck and Thelen (2005) refer to as gradual transformation (pp. 19-27). Corporate philanthropy continued to give to K-12 education in the U.S.; however, they started to change their approach from giving to schools to giving to education nonprofits, which were seen as better avenues to leverage their giving. They also started to work together more on some big projects. These changes in the role of corporate philanthropy in education happened through layering and conversion processes (Streeck & Thelen, 2005, pp. 19-27). It is a layering process because just as many of the experts said, many companies and their foundations still fund schools but they are increasingly funding nonprofits so they are layering this on top of what they are doing and slowly shifting funds in this direction. It can also be seen as a displacement process: although companies and their foundations in the U.S. have long been active in education, there was a feeling that their giving needed to be more strategic and more aligned to the competencies of their companies. This new logic led to a displacement process, where corporate philanthropy's role in education went from giving to schools nearby or schools with favorite projects towards funding more education nonprofit and advocacy work with a focus on the education of poor and minority kids and the long-term needs of the economy (and companies). It is exactly this displacement process that likely led to the STEM movement, which is addressed next.

Corporate Philanthropy in STEM

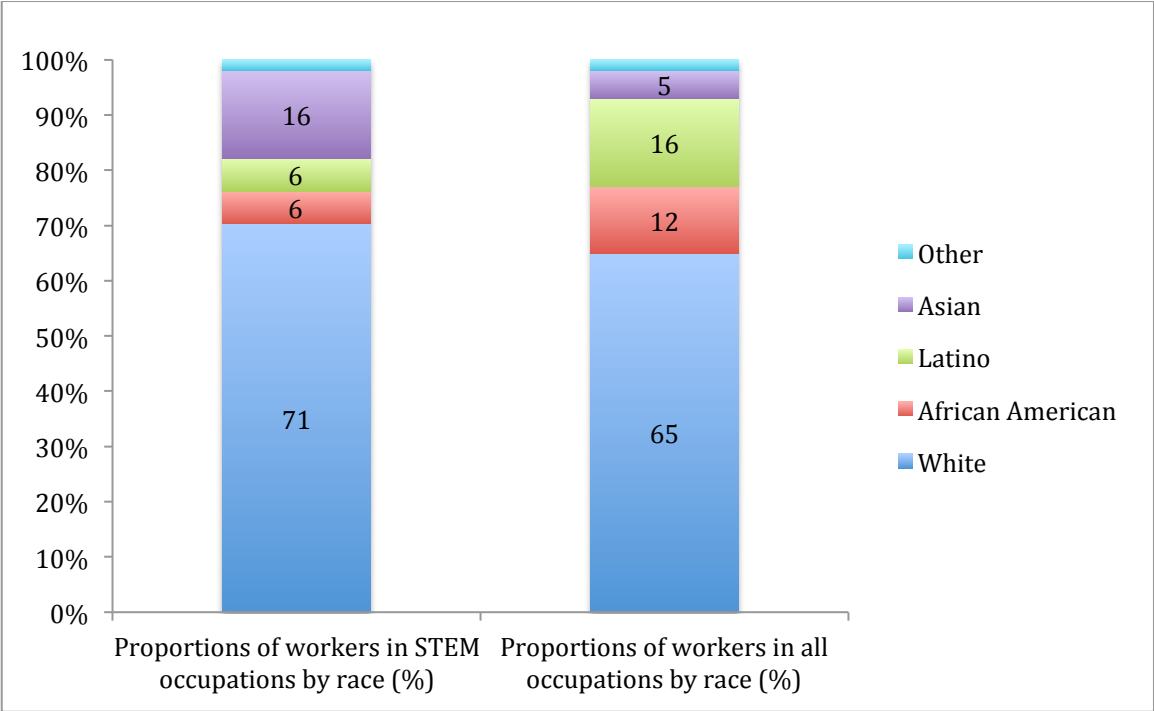
Most of the experts who were asked agreed that NCLB brought into focus the severity of the achievement gap. Of course, they had long been aware that on average, poor and minority students in the U.S. fared far worse than their more advantaged peers. Before the onset of NCLB and its data reporting requirements however, it was difficult to determine which schools were doing well by minorities, which ones were

doing well overall but not with minorities, and so on. As a result of the accountability requirements, schools unable to meet specific achievement targets for all subgroups received differing levels of sanctions. After a number of years being listed as “in need of improvement” they could be completely reorganized or even closed. While these happenings caused quite a stir in communities and education policy circles across the United States, there is no evidence that a sense of “education failure” as a result of NCLB was driving corporate philanthropy as I had hypothesized; rather it was a concern about the narrowing of the curriculum at the expense of the sciences and the over-emphasis on tests or what USI5M referred to as “testocracy” (Line 91) and a concern about the academic achievement of an ever-growing minority population.

The focus on the achievement gap can be considered a “policy paradigm” or a problem definition; which, results when most actors have adopted a common definition of a problem and it is tough to argue with. It changes the way the actors view the world (for definition see: Hall, 1993, p. 279; Mehta, 2013, pp. 18-23). As a result of NCLB and the data that flowed from it, there was a growing concern about the achievement gap or the differences in academic performance between poor and minority pupils and their more advantaged peers (Reckhow, 2013a, pp. 18-21). The years following NCLB led to more collaboration among corporate philanthropy, a focus on closing the achievement gap, and efforts to be more strategic with their giving (see above). To understand how some of these companies came to support the STEM education movement soon after, it is necessary to understand the ideas and influencing factors that drove it (Béland, 2007).

While many actors shared the concern about the achievement gap, it is important to note that for some corporate philanthropic actors, there was also a concern about how this affected the workforce. Looking at the STEM workforce compared to the overall workforce, it becomes obvious why. African Americans and Latinos are underrepresented in the STEM workforce by 50 percent and 62 percent respectively (Carnevale, Smith, et al., 2011, pp. 64-65).

FIGURE 7.2: PERCENT OF WORKERS IN STEM AND OVERALL WORKFORCE BY RACE



Source: Carnevale, Smith, et al. (2011), data from page 65, my own graphic representation.

There was a concern among companies and their foundations about the growing minority populations who are chronically underserved and how they would be prepared to enter the workforce but also how to serve a more diverse market.

TABLE 7.8: DIVERSITY IN THE STEM WORKFORCE AS A DRIVING CONCERN

“There is the falling behind issue. There is the ‘we are going to be a black and brown country, what are we going to do. People are not going to have the education they are going to need.’”

Line 234~USI3F

“Companies are increasingly aware of not only the need for a pipeline, but they are increasingly aware of the need for diversity in that pipeline because they see, first of all, untapped talent that they want to tap, for that work. The other is the marketplace. They are working in a diverse marketplace, they want people who have the perspective to shape their business interests, not just along the lines of traditional demographics, but along the lines of where the world is going. They see this as a high level business interest to get them.” Line 290 ~ USI5M

Sometime after 2008, the STEM movement started to pick up steam. For example an archive search of the New York Times does not show any entries for “STEM

Education⁶⁹ until 2010 and then 7 related articles in just two years. A Google search had 7,600 hits for 2001-2005 but 9,310 in 2008 alone and about 103,000 in 2014 (see appendix for data). The question is why did the focus on STEM become so prevalent so many years after the start of NCLB and why STEM, why not something like adolescent reading? The answers lie in a mix of tightening budgets, an even greater push to better align giving with company competencies, and an economic crash that emphasized the need to focus on the skills and industries with the greatest future potential- from political heavy weights and parents alike.

When asked why they thought corporate philanthropy became involved in the STEM movement after 2008, the experts mentioned the concern about the workforce as a driving reason. As the quotes below show, one of the ideas driving investment in STEM education is the idea that a highly skilled workforce is needed but that the education system is not doing enough to provide them with what they need.

TABLE 7.9: NEED FOR HIGHLY SKILLED WORKFORCE

“There is this real frustration that's underneath the skill's gap that I think is really motivating them the most.” Line 189 ~ **USI2MF**

“Companies today need very highly-skilled work force, so they depend upon the education system to generate that. They need talent. In a very simple, self-serving way, they want to make sure that there's an adequate supply of well-educated, talented people.” Line 15-~**USI5M**

“I think what they realized is that the future of jobs, and seeing a rapid transformation, especially with things like robotics and using technology, I think they were starting to realize these were the skills that were really necessary. These are the things that we needed.” Lines 230 ~**USI4F**

A key feature in ideational theory is the focus on the interpretations or the perceptions of interests. Ideational theories focus on the construction of the perceived interests that drive the behavior of actors (Hay, 2011, pp. 72-74). From a corporate and corporate philanthropic perspective, STEM education seemed important to address because of concerns about a population that is becoming minority majority with many of the minority populations not well served with regards to STEM education and at the same time, not having enough skilled people, and not having the technical capabilities to be innovative.

69 Note: “STEM” may apply to several countries, not just the U.S as English is used as an official language by many countries.

It appears that the STEM education movement among corporate philanthropic actors active in STEM is a sub-policy paradigm: it is a spinoff of the larger paradigm of the achievement gap that came to light through the NCLB data that led to a focus on improving education for all students but especially for poor and minority pupils. For those active in STEM education, the focus on fixing the achievement gap eventually morphed into a focus on the addressing the achievement gap and improving education and skill levels in the STEM subjects.

Even before NCLB, some employers were concerned about the state of the future workforce. Why then is it not until after 2008 that the interest in STEM takes off? When I asked the experts this question, a couple of themes surfaced. One was the effect the economic crash of 2008 and its ongoing ramifications had on students, their families, and the overall discussion around education. The experts mentioned the connection between having a high unemployment rate and still not being able to find the workers they needed spurred them into action. With parents, students, and companies all focused on the idea of acquiring more science and technology skills in an effort to remain relevant in a rough economy, this is an example of zeitgeist. The ideas for come from a set of cultural, social, and economic assumptions about the value of science and technology education; which went on to be prevalent in the public discourse (Mehta, 2010, p. 40). In other words the desire to invest in STEM were also have been part of a much larger public philosophy about the importance of STEM education in a time of economic and technological change.

TABLE 7.10: 2008 ECONOMIC CRASH FUELED INTEREST IN STEM

“If you look also at the trends here with what careers earn you a decent income, parents are beginning to get the notion that you are going to do better if you get a STEM or more technology focused degree... That’s partly because 53% of 2010 Bachelors degrees were either unemployed or underemployed. I mean the fiscal crisis really changed things pretty dramatically.” Line 239 ~ **USI3F**

“They’re going to say they can’t get the workers they need. They were saying that in 2008, when we were in the middle of a gigantic recession. People were being laid off all over the place. How could it be that there could be a shortage of workers when so many people were out of work? The answer was a mismatch, the mismatch between what the skill sets, ones that they could find, and the skill sets they needed. They couldn’t compete without that channel. It became a business necessity to do something about it.” Line 189~**USI5M**

“Right around that time, we started having significant problems with the unemployment rate, and people started looking around and realized that STEM jobs were great jobs and we needed to train people for them” Line 109 ~**USI6F**

The recession also led to some belt tightening on the philanthropic side “when the recession hit, one thing that clearly happened is that philanthropic budgets did not grow, not by any stretch of imagination. They haven't frankly rebounded back yet” (USI2MF Line 118). This makes sense from a corporate investment perspective. If money is tight and it is hard to justify philanthropic giving, it makes sense to align the giving to something aligned to the needs of the company.

Companies and their foundations also had a concern about technology and innovation in an increasingly digitalized economy. There seems to be a strong belief that technological abilities will ultimately determine the fate of the economy and as some of the experts below explained, there was concern that the U.S. was falling behind in preparing the workforce with these abilities. This was also a major theme in Germany.

TABLE 7.11: CONCERNED ABOUT TECHNOLOGY AND INNOVATION

“If you look at who is getting biology, chemistry, and physics majors, they are largely international students and largely Chinese and that is a big worry. There is the falling behind issue.” Line 234 ~ **USI3F**

“This was the same problem that other companies were having. I think that was what part of that whole wake-up call is, we've moving to the next generation of work, becoming more advanced, more technical, and we don't have the skills.” Line 327 Line ~ **USI4F**

“Everything we do, everything we touch is digital, we always have these things going on, and your house is a digital cottage. Everywhere you go, from your supermarket right to your laboratory. Everybody's tied into this stuff. The nineties was really when it was escalating, when the internet boom was really going. It was started in the eighties, actually, but it ratcheted up heavily in the nineties. Now you have this global competition around it. Technology is giving people the competitive advantage, or if they're not good at it, putting them at a huge disadvantage.” Line 166 ~ **USI5M**

As these concerns about technology and innovation were increasing, the first round of NCLB science test results was released. Under the law, English and Math were tested every year in grades three through eight and once in high school but starting in 2007, science would also be tested at least once in the elementary, middle, and high school years. The science scores, however would not count towards the accountability measures (Mehta, 2013, pp. 232-233; Ravitch, 2013, p.11). USI1M explained the rise in the concern as “I think it became important to realize that we had this attrition going on but we need more kids going into it and then when you combine that with what's going on with NCLB, especially around 2008, remember it's when states were all of the sudden required to test science for the first time. So now you're looking at,

and even though nobody was held accountable for it per say, still, it was like, eeh, this is pretty bad” (Line 242). The concerns about the narrowing of the curriculum towards the subjects that counted in the accountability plan at the expense of science and other subjects were mentioned earlier but taken together, it shows that corporate philanthropic actors who became active in STEM believed that the focus on accountability in just math and English; which many had championed was actually hindering student achievement in STEM subjects and the state needed to step in to fix it. This change in beliefs over time is also an element of a policy paradigm (Daigneault, 2015, pp. 50-53). If the National Assessment of Educational Progress (NAEP)⁷⁰ grade 8 science scores in 2009 was at all representative of their concerns, one could understand why because 30 percent of students tested were considered proficient or advanced in science. For grade four, it was 34 percent (U.S. Department of Education, 2015).

Interestingly, these concerns did not seem to be as obvious among business organizations such as the U.S. Chamber of Commerce or the Business Roundtable during the reauthorization process of 2007. They argued against changes to the accountability provisions of the law (Business Coalition for Student Achievement, 2007; Business Roundtable, 2007), which as some critics have pointed out, is what caused some of the narrowing of the curriculum and the lack of science and technology. As mentioned in the chapter about the 2000s however, this does not mean that the business community was not active on this front in other ways but that they addressed it outside of NCLB’s reauthorization through initiatives such as RTTT and i3. Why is not clear and did not come up in the interviews.

Research pointing to deficiencies in STEM education also influenced the decision of corporate philanthropic actors to wade into this area of K-12 education around 2008. “I think it [STEM] started gaining prominence when various research, when organizations started pointing out “look, we have a leaky pipeline” (USI1M Line 239).

The experts pointed to some common research reports as having an effect on corporate philanthropy’s decision to become involved in STEM education. One such

⁷⁰ NAEP is an assessment given every two years to a nationally representative sample of students.

report often mentioned was “Rising Above the Gathering Storm.” Tasked by a few members of congress and the National Academy of Sciences, a committee of Nobel Laureates, CEOs of Fortune 100 corporations, university presidents and former presidential appointees released this report in 2007. They were asked to identify the top 10 actions in priority order that federal policymakers should take to endure the U.S. would remain competitive in science and technology in a globalized economy. Their highest priority was: “Increase America’s talent pool by vastly improving K–12 science and mathematics education” (p.7). Included in the report were many statistics about the science and math achievement of American pupils on international and nationwide assessments and many recommendations for correcting the situation, including a heavy focus on improving teacher quality in these subjects and ways to vastly increase the number of students prepared to get a BA in math- or science-related majors (Committee on Prospering in the Global Economy of the 21st Century, 2007, pp. 2, 5-7, 94-99).

Another report was the Carnegie Corporation’s “The Opportunity Equation.” This 2009 report opens with “The United States must mobilize for excellence in mathematics and science education so that all students — not just a select few, or those fortunate enough to attend certain schools — achieve much higher levels of math and science learning.” The focus of this report was on making significant reforms to our education system so that all kids, with a big focus on poor and minority students, have access to STEM opportunities (Carnegie Corporation of New York, 2009, p. 1).

The mentioning of specific reports is a clear distinction from Germany where aside from the PISA reports; none of the experts mentioned any research as impacting the decisions of corporate philanthropy to engage in the MINT education. In the U.S. scholarly and advocacy research units are the most common (Merai et al., 2011, see also: Campbell & Pedersen, 2010) and it appears that they impacted corporate philanthropy’s decisions to invest in STEM education. This points to a more established policy and political influence structure in education and is not surprising given the long tradition of corporate involvement in K-12 education issues. While these reports all had some alarming statistics in them, reading scores were also not

that impressive and are also important in any job but were not seen as relevant to companies as the need for STEM education.

According to some of the experts, the TIMSS and PISA results were also influential. USI6F stated “OCED and PISA stuff. I think that's been pretty compelling. I've written more than a few memos on that for people. That starts to get at our pride as a country like, ‘Oh my gosh, we're not doing very well,’ and you start looking at how other countries are focusing on engineering or science in different ways than the US is. People start to get that information”(Line 154). International data was also prominently displayed in the “Gathering Storm” report. I had hypothesized that international assessments and rankings would have a minimal role in the decisions of corporate philanthropy in the U.S. because in general Americans do not pay much attention to international education rankings (Martens & Niemann, 2013, p. 315), it turns out I was wrong. Perhaps large international companies and their foundations are more influenced by the education think tanks, policy elites and lobby groups who regularly use the international data to make their cases for education reforms (Martens & Niemann, 2013, pp. 326-327). It seems that both national and international data and reports influenced corporate philanthropy in the U.S. to become active in the STEM education movement.

Another major reason for the increased interest in STEM education is that president Obama also started to promote the importance of STEM education alongside many corporations. “The bully pulpit of the White House that had a lot to do with it. President Obama made it (STEM) a big priority... and that he pulled the people together to make it happen. Many more organizations embraced it” (USI2MF Line 475). President Obama, starting in 2009, promoted STEM education and proposed many related initiatives (White House, 2009) and did so throughout his presidency. While Angela Merkel has also been active in MINT education to some degree, the fact that the Bundestag had its first hearing regarding MINT education in 2017 and there have been relatively limited funds dedicated to it (CDU/CSU/SPD, 2017, p. 4) shows that it has not been an issue she has championed.

The National Science Foundation (NSF) was mentioned as being a critical driver of the STEM education movement. This is not surprising given that NSF is one of the

largest federal agencies that financially supports STEM education (Carmichael, 2017, pp. 6-7). The America Competes Act of 2007, enacted during President Bush's presidency was also mentioned by USI6F (line 177) as a potential influencer because of its focus on investing in innovation as a way to improve American competitiveness; which included specific provisions to train more teachers in the STEM subjects and more Advanced Placement STEM opportunities.

For advocates of more and better STEM education at the K-12 level, improving teacher quality and providing more opportunities for high level STEM courses were seen as the most important factors. (Change the Equation, 2016; Committee on Prospering in the Global Economy of the 21st Century, 2007, pp. 112-134). Here it is important to notice that although improving teacher quality overall and increasing access to higher-level coursework for all students but especially for poor and minority students had been a big part of the focus in education policy in the early years of NCLB, now these same policy ideas were being applied to the more narrow focus of STEM subjects. This shift can be seen as an element of a policy paradigm (Daigneault, 2015, pp. 50-53) or as I argue a sub-policy paradigm. The policy goals and related ideas have not really changed, they have just become narrower.

Close attention not only to the ideas and where they come from but also to other factors influencing the decisions of actors are important in understanding why one idea wins out over others (Béland, 2007). In the case of corporate involvement in STEM education, there were many influencers. The Obama administration's initiatives and ability to raise awareness about STEM impacted corporate funders but so did international reports such as PISA or TIMSS. National reports such as the "Opportunity Equation" and the "Gathering Storm" reports and a science and math education zeitgeist that was tied to the economic crash also influenced companies to become active in STEM education. Similar to Germany however, the largest concerns seemed to be with the workforce but in the U.S., the main focus was on diversity in the STEM workforce, not the size of the workforce all-together.

While there were many actors and influencers arguing that there were not enough people graduating with STEM degrees and therefore, significant investment needed to be made in improving STEM education at the K-12 level, the question is if this is this

true? The answer to this is quite complicated with arguments and data that support and undermine the need to focus on STEM education.

An analysis from the Center for Education and the Workforce calls the need for more and better STEM K-12 education into question. It shows that more than 75 percent of all high school students who scored high in math on the SAT exam, which was used as an indicator of probable success in STEM courses in college, did not major in STEM subjects in college. It further showed that just half of all students who start off with a STEM major actually graduate with one. Furthermore, because the U.S. produces more STEM college graduates than the economy needs, more than half of them do not actually go on to work in STEM fields. Those who do not continue on in the STEM fields work in sectors, such as health care or management where STEM skills are highly applicable and result in higher wages and where the work environment may be more attractive. For African American and Latino students; however, far fewer score high in math on the SAT⁷¹; which in addition to other factors leads to low completion rates in college in the STEM fields and ultimately to being underrepresented in related jobs. Improving STEM education in K-12 can be helpful to closing the STEM skills gap, especially for minority students but much more needs to be done to actually excite students about STEM jobs and to make these jobs more attractive (Carnevale, Jayasundera, & Hanson, 2011, pp. 40-57, 64-65). In other words, while programs aimed at closing the achievement gap in STEM at the K-12 level may have an impact given the poor performance noted above, the overall problem with the pipeline is not in K-12 education but in higher education and the labor market.

Other analyses rely on the poor performance of U.S. students on international assessments such as PISA or TIMSS and the declining position of the U.S. in terms of the percent of people with a Bachelors' degree. In these analyses, researchers often point to the below average performance of the U.S. in math and science tests as reasons to fear for the future in terms of not having enough scientists or engineers (Change the Equation, 2016; Committee on Prospering in the Global Economy of the 21st Century, 2007). Some caution however that focusing on K-12 education as it

71 Refers to college admission exam

relates to STEM graduates is flawed because of the extremely long time period between when these programs occur and when the students that benefit would actually get a degree and that focusing on the averages does not focus on the higher achievers who are most likely to become scientists and engineers (Teitelbaum, 2014a, pp. 24, 26). Focusing only on the high achievers however, may not help in closing the achievement gap.

The Carnevale et al. analysis also argues that although a lot of STEM education initiatives have been aimed at the elite STEM professions requiring a college degree or better, the real problems in American education lie within the pipeline to middle skill jobs that require more than a high school degree but less than a BA. “Making sure we have an adequate STEM workforce goes beyond the postsecondary system [...] Yet, American high schools offer very little career and technical education or any substantial on-ramps to postsecondary career and technical education” (Carnevale, Jayasundera, et al., 2011, pp. 75-77). The question is if corporations and their foundation see it this way too and if they are funding career and technical education (CTE) as part of their STEM initiatives.

When asked about corporate philanthropic investment in vocational education initiatives and if they were tied into the STEM movement, most of the experts mentioned a growing interest in CTE that sometimes has a STEM component. This is significant to note because companies in the U.S. have traditionally not been involved in vocational education, especially not through corporate philanthropy. As one of the experts in the table below explains, companies that long funded general K-12 education started to become interested in CTE because of their needs.

TABLE 7.12: INCREASED INTEREST IN VOCATIONAL EDUCATION

“I think you're starting to see more and more companies, BMW, manufacturing and auto companies have really started to look at it [CTE] more. I think that there's a little bit of a mix of companies. I would also say that Chevron is taking a huge look at this. Intel is looking at this. These are companies that were really true to the K-12 education world, that now realize they have big needs because of the advanced manufacturing that's coming into play.” Line 139 ~ **USI4F**

“I think it's (investment in CTE) increasing [...] My evidence for that would be how often and how common it is that we meet business people who immediately grab onto it and agree that it's the right thing to do.” Line 328.” ~ **USI5M**

“I'm seeing that more and more - the state leadership anyway, people are wrapping their arms around more not just four year degree but workforce development and how we can be a part

In addition to the companies mentioned above, IBM was considered a lead actor in this space because of their P-Tech schools (USI4F, USI3F); which was also mentioned by President Obama in his 2013 State of the Union address as an excellent exemplar of preparing youth for the economy (Obama, 2013). It is important to point out a difference to Germany here. In the German context, when asked about the relationship between investing in STEM and vocational education, the focus was on getting more students interested in and better preparing them for dual vocational training programs that had a STEM focus. In the U.S., a program such as P-Tech is focused on actually creating these programs. Knowing that I was working on a comparison between the two countries, GI4M made a similar comment “the US companies don’t have apprenticeship systems, so for them everything is philanthropy” (Line 202).

Another name that was mentioned was J.P. Morgan Chase because of it’s recent announcement of a \$75 million New Skills for Youth initiative, a philanthropic endeavor aimed at helping youth get in-demand skills (USI3F). In these cases, we see American companies using what Matten and Moon (2008) refer to as explicit CSR for initiatives that are implicit CSR in Germany. Where in the latter, it is simply expected of the companies as part of their societal role, in the U.S., such investments can give them a chance to show they are being socially responsible by providing new training opportunities.

USI2MF talked at length about specific companies they knew about who were investing in CTE initiatives but were cautious to say that the interest is not across all sectors or put more frankly “I wouldn’t say there’s a huge groundswell right now but there are enough people talking about that at the technical level” (Line 295, quote line 370). USI5M explained that “there are companies, business minds where there’s a very specific interest in CTE because there’s a very specific skill set they want” (Line 314). Wanting a very specific skill set indicates that some companies do not feel the state is training students in ways that can provide them and therefore they need to step in. This is a shift in the U.S. where companies have traditionally not played a role in

CTE but have waited for them to finish whatever level of schooling was necessary and then did some for of on-the-job training.

The Pathways to Prosperity paper from the Harvard Graduate School of Education; which advocates for businesses to take a greater role in creating career pathways, as something that was also driving interest in vocational initiatives according to USI2MF. As USI4F explained it, the interest has been driven by “this realization, and there's been so many studies and so much information out there now about the workforce.” Again, here is an example of scholarly and advocacy research having an impact on the decisions of corporate philanthropy.

At the federal government level, there was also increasing support for vocational education and more specifically for apprenticeships, including at the high school level. In 2015 there was \$175 million in funding for expanding apprenticeship opportunities through public-private partnerships including those with employers, unions, and nonprofits. This was followed by \$90 million in 2016 to both encourage more businesses to provide apprenticeships but also to diversify the trainees in these programs (White House, 2016). In addition, the Obama administration's Blueprint for Transforming Career and Technical Education noted that the 2006 reauthorization did not do enough to bring employers and students together in a systematic way. It called for CTE to have more alignment to and collaboration with industry both at the secondary and postsecondary levels (U.S. Department of Education, 2012, p. 2). The business community also supported the Blueprint with the Business Roundtable, the U.S. Chambers of Commerce, and several other business organizations advocating for it (Opportunity America, 2017).

When asked more about how CTE and STEM initiatives among corporate funders were related, some of the experts saw these as completely different fields of investment that are sometimes linked. USIF3 explained it most succinctly with “there is a difference between STEM and CTE. A lot of the STEM work is focused on people who are going to go on and get at least a Bachelors degree, if not PhDs and to strengthen STEM in the K-12 system in order to attract more minority people to STEM but that is different than career pathways” (Line 160) but she also said “There is plenty around STEM but only a subset of the is related to CTE” (Line 157).

Similarly, USI4F said “, I think companies are still a little bit divided. They feel like, ‘I’m funding CTE, or I’m funding STEM’” (Line 280). She noted that both of these areas are increasing among corporate funders and that she knew of a district that receives a substantial amount of corporate philanthropic funds; which, has CTE programs with a heavy STEM emphasis and does not draw a line between the two but she concluded with: “I think that we still have a long way to go until we really start to see STEM and CTE very much so a part of each other” (Line 270). That STEM education initiatives are geared more for those going on to get a BA or even a PhD is at odds with some of the data above that argues the largest need is in middle skill jobs that do not require these levels of education. So while STEM and CTE are not tightly bound, it appears that CTE funded by corporate philanthropy is making inroads and sometimes it is focused on STEM.

When asked how STEM and CTE were related, some explained that although there should likely be more investment from companies in STEM and vocational education, the reality is that most companies and their foundations have no idea how these subjects are actually divided up in schools and this hinders their abilities to actually get what they need. The interest in CTE but the lack of awareness about how it fits in with secondary education is not surprising given the hands off approach companies have traditionally had with vocational education in the U.S. and is completely different than the German case.

TABLE 7.13: RELATIONSHIP BETWEEN STEM AND CTE

“It’s not as much as it should be. There’s, there’s still turf” Line 290// “I don’t think that it is that obvious to them [companies]. Because, the number of times I’ve had to explain to people, well, engineering is historically in the career-tech ed department and I get that kind of quizzical look. Well there’s a department that really focuses on kind of career issues and there’s the academic part and so I don’t know how cognizant they always are that things are in separate places” Line 326 ~ **USI1M**

“They’re [big companies] not thinking, about CTE, they just want talented people, however you call it, whatever branch of education does it. If I mentioned CTE to my STEM advisory committee, I always have to quickly explain what I’m talking about” Line 308~ **USI5M**

This is also evident in the STEM Education Coalition, an advocacy group that “works aggressively to raise awareness in Congress, the Administration, and other organizations about the critical role that STEM education plays in enabling the U.S. to remain the economic and technological leader of the global marketplace of the 21st

century” (STEM Education Coalition, n.d.-b). It is a nonprofit organization but it has a 501c4 designation from the IRS,⁷² which allows it to lobby without jeopardizing its tax exempt status because it is considered to be lobbying to promote the common good and general welfare of a group people (IRS, 2016). The coalition, made up of hundreds of STEM related educator organizations and nonprofits, business associations, and large companies (STEM Education Coalition, 2011), has many policy recommendations for improving STEM education. One of them is to encourage public-private partnerships that promote business and industry involvement in STEM education (STEM Education Coalition, 2012). Most recently this has been applied towards advocating for legislation related to the Carl D. Perkins Act and for a pilot apprenticeship program (STEM Education Coalition, n.d.-a).

Summing up the vocational education aspects of corporate philanthropy’s STEM involvement: in addition to and sometimes in alignment with their interest in STEM education, companies have become more active in CTE. All experts agreed that there is a growing interest among many companies in CTE but that the degree of this interest varied considerably and was often tied to their specific needs and workforce concerns. These concerns come from reports they are reading about the workforce but also their own needs. Additionally, while these vocational initiatives are not always linked to STEM at this point, some of the experts mentioned that a subset of these vocational education investments was linked to STEM. Some cautioned that although there is growing interest in both STEM and CTE, a lack of understanding among corporate funders about how schools are structured impeded their development. The interest of the companies along with the increased funding and attention to apprenticeships and CTE from the federal government was a shift from the traditional roles they have played in K-12 education. Whether companies and their foundations will continue to become more involved in vocational education remains to be seen.

On the corporate philanthropic side, there was also a push to better align philanthropic work with their competencies as a company. For example, when asked why they were not supporting adolescent reading, they said reading was seen as something not aligned to their competencies and as being addressed by others and therefore not seen

72 Refers to Internal Revenue Service

as something they should wade into. This alignment of company competencies also fits with the broader movement within corporate philanthropy to be better aligned to the company itself and to be used towards the competitive advantage (Porter & Kramer, 2002).

TABLE 7.14: FUNDING STEM INSTEAD OF READING

“This (Reading) was something that a lot of folks were already behind, but no one was really talking about STEM.” Line 236 ~ **USI4F**

“For the kind of company we are, where science and technology and math matters so much, it's sort of just like a natural extension. We understand it better. We kind of get it. We've got a bunch of scientists and mathematicians running around. We don't have a lot of reading experts. I mean, we all know how to read.” Line 120 ~ **USI6F**

STEM education was also seen as something that would not cause controversy. This is a critical difference between corporate philanthropy and general philanthropy. Corporations have shareholders and customers, who may be adverse to particular education issues; which limits the initiatives corporate philanthropy can invest in (Himmelstein, 1997, pp. 3-6). STEM is seen as a way to be active in education but without risking the ire of the public and not be criticized for their involvement.

TABLE 7.15: STEM IS NONCONTROVERSIAL

“(companies) were willing to get fairly political but then because of pushback from the public which made their companies look bad, they have retreated.” Line 257 ~ **USI2MF**

“I would say STEM was actually really a safe area for companies to invest. By that, it was safe because it wasn't an area that you would get a lot of criticism.” Line 24 ~ **USI4F**

Companies also have to be careful in their giving to be sure it does not appear to be a marketing tool or that they are using it in a way that leads directly to selling their product. According to USI5M, “Companies do want to be identified with good corporate philanthropy. They want credit for what they do because it's part of their public relations. They have to be careful that it doesn't look like a commercial for their product. It must be ethical, and they have to be very careful how they do that” (Line 462).

The idea that investing in STEM education was seen as a safe bet or noncontroversial was unique to the U.S. None of the German firms even mentioned this as a concern. This may be due to some of the experiences U.S. companies have had in the past with

more controversial education initiatives that ended in flames because of protestors at company head quarters or boycotts of products and an increasing skepticism of philanthropy's role in education. In this sense, investing in STEM education in the U.S. is seen as a way give in a way that is not antagonistic but seen as a way to build profitable partnerships. This further adds to Frank Adloff's finding that in the U.S., due to a history of aggressive behavior by foundations, people are more critical of foundations than in Germany (2010, p. 417). In this sense, the idea of investing in something that would be relatively uncontroversial and would result in beneficial partnerships was key for corporate philanthropy; which also needs to maintain a good reputation for its parent company. For companies just coming out of an economic crash needing both to justify philanthropic spending of any kind and needing to showcase their ability to help society, STEM education was a safe bet. It allowed them to wade into an area of education that was increasingly important to parents and students but that was non-controversial and allowed them to work with many actors.

From reading the last few pages, one can see that there were many reasons and influencers behind the decision of corporations to invest in science, technology, and math initiatives but the acronym STEM was a critical step in bringing the actors together and as a way to brand what they were pushing for. How new bands of actors are brought together is an important part of a policy paradigm.

TABLE 7.16: STEM THE ACRONYM AS A COMMON UMBRELLA

“No longer have to say science, technology... STEM is so well known now but just four or five years ago you still did.” Line 445~ **USI2MF**

“Yeah, I think it [STEM] is just starting more of a conversation. You have one company sitting around, talking about, ‘Here's the issues that we're facing. I think there's a lot more that's happening with educators and business coming into the room together to talk about these issues, and how to solve for them. A lot of nonprofits have popped up, as well. I think the good part of this is that it's on the radar.’” Line 381 ~ **USI4F**

“It's an easier one to remember compared to a lot of acronyms I know. The evidence is the fact that you called me about it, and everybody's talking about it, so it must have worked. Everybody's into it, right?” Line 373 ~ **USI5M**

“I think there's good because it brings focus. Right? It's like these four things we care about. It's broad enough that you can have lots of players involved.” Lines 225-227// “It's a good kind of pull, a good magnet. It's easy to remember, all of that.” Line 230 ~ **USI6F**

Two experts (USI2MF and USI4F) mentioned that STEM was built on the back of SMETH, a National Science Foundation (NSF) initiative and that at some point it was

even called METS but that it was not until it was called STEM that it really caught on. Other researchers have also noted that after Dr. Judith Ramaley at the NSF switched it from SMETH to STEM, it became a very popular movement (Banning & Folkestad, 2012, p. 730; Carmichael, 2017, p. 1). No one was really sure why STEM caught on so much quicker than the previous acronyms aside from the fact that it was easy to remember, especially in the education field, which is full of acronyms. Changing the discourse in a way that brings more actors together as a strategy is an important part of a policy paradigm (Mehta, 2013, pp. 19-20). In this case, branding in a way that is easy to remember was key.

When asked about who the STEM movement brought together, the experts pointed to educators and businesses but more specifically, businesses that might not have worked together otherwise. According to USI6F, “It's not just the Googles and the Facebooks of the worlds, but there's lots of different types of companies that meet and play in the STEM space, any one of those four ideas” (Line 275). USI2MF also mentioned in reference to STEM education, “Regardless of their political leanings [company leaders] saw that it was in their best interest to play nice around this issue. It was basically a win-win. It was something they cared about” (Line 540). This is also evident in the lists of companies from many different industries that are members in STEM organizations such as the STEM Coalition or Change the Equation which include energy, technology, communication, and chemical companies (Change the Equation, 2013; STEM Education Coalition, 2011).

Although the common language brought actors together, not everyone was convinced that the actors were working together closely. There were concerns about whether the acronym diluted the substance of the STEM education movement. USI2MF also explained that not all parts are weighted equally, that it could for example be written as **SteM** because when people talk about STEM education, more often than not, they are talking just about math and science (Line 494). Given the broad range of topics and interest areas covered by STEM, this is not surprising but by aligning their views they are included in the movement which is much more advantageous than not being a part of it (Mehta, 2013, pp. 19-20).

TABLE 7.17: STEM BRINGS GROUPS TOGETHER BUT NOT WITH FOCUS

“It helps bring them together, I just don’t know it brings them together with focus.” Line 376 ~ USI1M
“Well I don’t think they really work together because all of them want their own credit. That is the problem, each of them has their own particular way of doing this and requiring data and holding people accountable.” Line 305 ~ USI3F
“It gets kind of watered down because people begin to think of it as just like one thing, and it's not.” Line 236 ~ USI6F

As mentioned above, one of the major advantages some of the corporations saw in the STEM education movement was that it was non-controversial. From USI4F’s standpoint “With STEM, I think it's different, because it's the future. It's about what's next. A lot of people are talking about technology and engineering, and they're seeing it as a positive thing. You don't get this backlash... Who's going to argue about advancement, and if they do, they kind of look foolish” (Line 404).

When asked if there was anyone who opposed the STEM education movement, all experts indicated that there was no opposition to STEM itself but some cautioned that there were concerns about “S” in STEM and from groups that felt additional subject areas should be included. Being against the “S” referred to those who generally supported improving STEM in their state or district but were against the teaching of topics such as evolution or climate change. The other concern that was mentioned was that focusing on STEM was occurring at the expense of other subjects such as English, history, art, and music. This is an interesting concern because the narrowing of the curriculum under NCLB and the lack of attention to science and technology was part of what drove the interest in STEM education among corporate philanthropic leaders. There are also academics (see above) that question the need for more STEM graduates, however, it is important to note that there is no organized opposition to the STEM education movement. This lack of backlash has also allowed companies to be more open and up front about their investments in STEM education and to collaborate with many other companies and nonprofits about these issues, something Matten and Moon (2008), would consider to be a way of being even more explicit.

TABLE 7.18: NOT OPPOSED TO STEM EDUCATION BUT OPPOSE ASPECTS

“You have people who in the same breath will talk about STEM but rip science.” Line 390// “we got a lot of people that oppose science in general... you know, your Tea Party folks, we got Ted Cruz who is in	Oppose Science Aspect
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charge of the science committee in the house right now who you know, evolution, climate change, all those terrible, evil, of the devil kinds of things.” Line 386 ~ USI1M	
“There is pushback at least against the ‘S’ because there is certainly the religious right that is quite uncomfortable with the direction.” Line 636 ~ USI2MF	Oppose Science Aspect
“Well, there are groups that oppose evolution.” Line 313 ~ USI3F	Oppose Science
“Groups out there that they are opposing what they perceived to be the overly exclusive attention to STEM. [They] argue there needs to be a better focus on humanities.” Line 617 ~ USI2MF	Not Broad Enough
“I think many people are concerned that STEM is using up all of the money that could be for arts and music and helping kids to be creative.” Line 318 ~ USI3F	Not Broad Enough
“Then there are people are trying to get in the club, the arts want to get in, call us STEAM.” Line 375 // “I don't think I know any groups that are against STEM... There's a wariness of making STEM the be all and end all. I don't think they're opposed to STEM, but they're worried that in the rush to turn everybody into a STEM student, that other things will get lost or ignored that also matter.” Line 386 ~ USI5M	Not Broad Enough
“I know the poor English teachers might feel a little left out. History teachers. I don't think oppose is the right word. I think it's just this notion of priority settings. Everything is so much about STEM all the time. The liberal arts people kind of wonder aloud is there value to be had in reading great literature and being able to think. Of course there is, but getting a company to focus on that in their giving might be a little hard.” Line 247 ~ USI6F	Not Broad Enough

Even the country’s largest Teachers’ Union, the National Education Association (Daigneault) was fully on board with the need to improve STEM education with the help of companies and philanthropy. The union put up \$500,000 and challenged technology companies and philanthropists to raise an additional \$1.5 million towards increasing the number of certified teachers in STEM subjects. According the union president at the time, Dennis Van Roekel, they were doing this because “Our nation’s prosperity is tied to innovation and that innovation will be spurred on by our ability to engage our students in STEM subjects and programs” (Walker, 2012). For many public education advocates, including teachers unions, pushing for STEM is another way to push for additional funding; which they are always doing (Teitelbaum, 2014a, p. 27) but with the backing of the business community.

The STEM education movement is a sub-policy paradigm because just like a policy paradigm, it has little to no opposition, it brought groups of actors together (while pushing out others such as those supporting English or Arts), and it created its own discourse (Daigneault, 2015; Mehta, 2013, pp. 19-20). It is a niche within the overall

paradigm of closing the achievement gap and improving education overall that many of the companies had been supporting in the early years of NCLB. It is still a spin off of the standards-based accountability movement. It is not that corporate philanthropy completely stepped away from that movement but that some have narrowed their focus to STEM education issues and in doing so have created their own mechanisms for framing the conversation and raising awareness.

For those active in STEM education, the focus on fixing the achievement gap eventually morphed into a movement aimed at improving teacher quality and access in the STEM subjects for the same populations of pupils. By framing it this way and by tying it to the need for more people with skills needed by industry, corporate philanthropic actors were able to bring together educators and many companies who may not have worked together under the brand of improving STEM education. The focus on using corporate philanthropy to address more specific needs of the economy rather than K-12 education in general also led to some investing in vocational education initiatives; which is a diversion from their traditional involvement in education. In the table below, each of the four elements necessary for a policy paradigm according to Daigneault (2015) along with the corresponding time frame are summarized.

TABLE 7.19: POLICY PARADIGM ELEMENTS IN THE U.S.

Element	Early 2000s	~2009 and onwards
Ideas about the current state of the problem and the role of the state	Concerned about achievement gaps after NCLB data, corporate philanthropy questioning approach to providing funding schools run by state, supported standards movement	Assumed problem definition that STEM achievement gap is the main concern, state role is still to run schools but seen as needing more input and advocacy to steer towards more STEM skilled workers, including in CTE
Belief that the problem requires some type of public intervention	Under NCLB, belief that state needs to play larger role in holding schools accountable	Belief among corporate philanthropic actors that NCLB had gone too far and narrowed the curriculum, action needed to be taken to include more emphasis on STEM subjects

Concepts of policy goals that should be pursued	Improving academic performance overall but especially for disadvantaged groups	Policy goals included improving STEM education and offering more of it but especially for disadvantaged students
Ideas about how to achieve the goals through policy	Through NCLB Standards, testing, accountability, improved teacher quality	Improve STEM teacher quality, access to more and higher level STEM courses, especially for disadvantaged students

Lastly, Daigneault (2015) argues that in order to prove that a paradigmatic shift happened, actual policy changes must be evident; which may include new laws, statutes, guidelines, or even smaller changes (pp. 50-53). I discuss these details in the next section on institutional entrepreneurs but as you will see, I argue that indeed, there have been policy changes with the inclusion of STEM language in the federal RTTT and i3 contests, the new Every Student Succeeds Act (Bailey & Morest), and in many other areas of education and science policy.

From Ideas to Actions in STEM Education

A sub-policy paradigm, which changes the ways actors view the world is in itself not enough to actually improve STEM education, rather, the agenda needs to have a way to be propelled so that government entities will be more aware and more resources can be driven in this direction. The question is if this has been happening in the STEM movement and what the role of corporate philanthropy has been. Were they acting as institutional entrepreneurs by mobilizing resources, developing discursive strategies, and bringing together new groupings of stakeholders (see also: DiMaggio, 1988, pp. 14-16; Leca et al., 2008; Thümler, 2014; Thümler et al., 2014a).

The previous section about the sub-policy paradigm showed that STEM education has been framed as needing to be improved and to have more of it in the name of a brighter economic future. STEM as an acronym is used to bring together companies, nonprofits, foundations, policymakers, and educators together. It has brought the Googles of the world together with those making chemicals for agriculture and with education leaders across the U.S. but all with a focus (even if it is not always so focused) to push for more STEM. This is a change from the early 2000s when many of these companies were supporting the accountability movement more generally.

While the subjects of STEM may have been addressed separately, they were wielding less influence. Even though as explained above, some would still write it as SteM because of a perceived over emphasis on Science and Math, and some question much of the content of the “S,” the acronym has been something to unite under and seen as a way to propel the issue of STEM education forward. In their discursive strategies, institutional entrepreneurs try to frame the problem, develop a common language, and raise awareness of the issues and possible solutions (Leca et al., 2008), pp. 11-14, which are also common to advocacy work (Clark, 2010, pp. 12-15; Leca et al., 2008, pp. 11-14). The question is if companies and their foundations have been playing a leading role and if they have been successful in raising awareness of STEM education issues.

According to the experts interviewed, corporations and their foundations are leading the STEM education movement. For some of the experts, it was clear that companies were the drivers of this because of their needs for more skilled workers. They see themselves as the natural leaders because of their deep ties to the economy and their leading role in technological innovation. It is these ties that allow them to maintain their legitimacy with many of the stakeholders they mentioned including educators, policymakers, parent companies, other companies, and business associations. Maintaining legitimacy across many stakeholders is critical for corporate philanthropy (Himmelstein, 1997, pp. 3-6) but it also serves as a bridge for the company into other areas of society where they may have even more influence (Adloff, 2010, pp. 396-398; Gerber, 2006, pp. 17-18).

TABLE 7.20: CORPORATE PHILANTHROPY AS LEADERS IN STEM EDUCATION

“The corporate world is talking about STEM frequently because it is true that the corporate community is very much at the forefront of innovation and technological advancements and all of that. That’s the big argument that’s out there that’s driving a lot of the STEM movement.” Line 694~ **USI2MF**

“I would say yes, because it's being driven a little differently, where corporations are saying, "Here's the jobs that we need, and here's the skills that we're looking for. I think by them talking about it has raised awareness with educators and their institutions about the real need for STEM.” Line 411 ~ **USI4F**

“I'll broaden it as corporate. Businesses all over, not just corporations. I think everybody who's in the business world right now is well aware of the value of STEM capacity in their business interests [...] If you go to a business round table, they're all over this. If you talk to the Chamber of Commerce, they're all over this.” Line 398 ~ **USI5M**

“I think the message, the way the messages have played out, have been so tied to employment

and economy that companies have naturally been leaders in the movement [...] Maybe this is just the space I work in, the messages are so much more functional. Like economy, jobs, skills [...] and because of that, corporations have been really in the forefront. Not to say that teachers aren't there either. I feel like political leaders, elected officials, see it as a driver for their economy, so they often make those same kind of messages. It's great for them to get with the new tech center and their city or state or the new bio-engineering thing.” Line 256 ~ **USI6F**

Corporate philanthropy was also seen as taking the lead in raising awareness about deficiencies in STEM education to government entities. USI6F explained this as “I think if there's a problem, awareness isn't one of them. I think they're generally aware that this is important. I think we are doing a good job” (Line 277). She then went a step further to compare the STEM education movement to foreign language instruction- an educational area that many Americans have long talked about improving. However, it has no dedicated lobby and minimal corporate interest. As a result it has not been able to raise awareness and one would definitely not consider a movement (Line 282). This is of course different to STEM, which appears to have several groups actively lobbying for it or advocating for STEM education. This also shows that just as general philanthropy has increased its footprint in education policy as a way to leverage their investments (Clemens & Lee, 2010; Hess, 2005a, pp. 297-301; Reckhow, 2013a, pp. 140-144.), so has corporate philanthropy.

TABLE 7.21: STEM EDUCATION AWARENESS STRONG

“We’ve got the Carnegies and the GEs and Chevrans who stand up at the front and say ‘this is what we need for our graduates to have.’” Line 454~ **USI1M**

“They [corporations] do it under the umbrella of a Nonprofit⁷³, a coalition of corporate America is doing this [raising awareness].” Line 744 ~ **USI2MF**

“All the companies are all over this ... Money talks, and it's talking... Its yelling.” Line 404 ~ **USI5M**

Indeed with all states engaged in policy discussions about STEM education (Carmichael, 2017, pp. 80-82) and many policy discussions at the federal level both in Congress (Gonzalez & Kuenzi, 2012, pp. 2-3) and in the White House, it appears that STEM awareness is fairly strong. Two of the experts however, felt that although awareness had been raised it was not enough (USI1M and USI4F). USI5M also cautioned that although there is a movement, he was not certain that “there's is yet an effective coordination among business interests and government to create a full

73 Nonprofit is not named to protect anonymity

fledged movement that's effective. I think there's movement to be sure. It's not at zero. I don't think we're at the 'we got our act together stage'" (Line 421). This raises a question: has there been enough awareness to lead government entities to invest in STEM initiatives that were started by corporate philanthropy? Were they able to bring these additional resources to the table?

When asked this question some of the experts gave a range of examples of STEM education initiatives (USI2MF, USI4F, USI6F). One gave an example of federal-level initiatives inspired by Code.org, which has several corporate philanthropic funders. This organization with its goal of giving every student in every school the opportunity to learn computer science and its hour of code initiative attracted the attention of the White House. This ultimately led to the Computer Science for All initiative; which came with a proposal of \$4 billion. Although the funding was ultimately not actually granted by Congress, some programs using \$135 million in existing funds were repurposed towards computer science initiatives through the National Science Foundation (M. Smith, 2016).

Another example given was the College Readiness Program, which is aimed at expanding access to advanced placement classes, and has a special focus on STEM. Started as a pilot with one school district through corporate funds, it is now in more than 1000 schools in thirty-four states and receives funding from the U.S. Department of Defense and from many companies and foundations (National Math and Science Initiative, 2016). At the state level, one example was the UTeach program, which works with math and technology majors to become K-12 teachers. Started with philanthropic support on one campus of the University of Texas, UTeach picked up substantial state funding and went on to spread to more than 40 universities across the country (UTeach, 2017).

The Race to the Top (RTTT) competition although not mentioned by the experts, its inclusion of STEM education requirements is another indicator of the changes made to U.S. education policy. To win a portion of the \$5 Billion available states submitted applications that addressed college and career ready standards, known as the Common Core standards, and tied accountability provisions to them such as teacher evaluations, and they had to have policies to encourage charter school growth. Priority was given

in the RTTT application process to states with plans that addressed various STEM issues (U.S. Department of Education, 2009). RTTT had substantial political support from the business community (Business Roundtable, 2009; U.S. Chamber of Commerce, 2009). This is another example of how the STEM movement, which was led by the companies and their foundations developed inroads to federal education policy.

At the time of my interviews, NCLB had not yet been reauthorized or in later interviews, was extremely fresh in its current form, the Every Student Succeeds Act ("Every Student Succeeds Act,") but it is critical to note that significant weight was given to STEM education in the nation's most comprehensive federal education law. STEM education is included for teacher training and professional development provisions, student support and academic enrichment provisions of the new law ("Every Student Succeeds Act," 2015, pp. 195,217,224,243). There is also language about computer science specifically; which is the first time this has ever been addressed in the federal education law. The point here is that STEM education had been elevated to a level so that it was included in the farthest reaching federal K-12 education law. While most of the education policymaking happens at the state level, the inclusion of STEM in federal education law will have an impact on how states will use their federal funds and that is in turn likely to influence what they do at the state level (D. F. Smith, 2016). This can be seen as huge success of the STEM education movement where corporate philanthropy has been playing a leading role. It is also in line with what has been happening in general philanthropy with regards to having a larger influence in federal education policy. As with general philanthropy, this is a shift in comparison to the former decades when they funded school and district initiatives directly and were not as involved in education policy endeavors (Clemens & Lee, 2010; Hess, 2005b, pp. 5-6; Reckhow, 2013a, p. 41; Reckhow & Snyder, 2014, pp. 187-188).

It is complicated to find an exact figure for the amount the federal government spends on STEM education. Government analysts have identified between 105 and 225 different STEM education programs at 13-15 agencies with overall spending estimated to be between \$2.8 and \$3.4 billion. The three agencies most involved are the Department of Education, the National Science Foundation, and the Department

of Health and Human Services (Gonzalez & Kuenzi, 2012, pp. 3-6). As a result of the multiple different analyses, it is difficult to say whether or not there has been a large increase in spending on STEM education at the federal level. Regardless, with the amount of federal spending on STEM education estimated to be in the multiple billions, it is a completely different situation to Germany where federal spending on STEM education is much more minimal and likely less than 100 million Euro per year.⁷⁴

In sum, yes companies and their foundations are institutional entrepreneurs in the STEM education movement. They are bringing together multiple actors behind a single message of improving STEM education. The acronym STEM has allowed them to develop a common language, something that is quite simple for people to say and to know what it stands for. While some have argued that the awareness could be even better, as detailed above, they have actually been quite successful in bringing awareness to all levels of government. All 50 states have some form of STEM education policy discussions and laws and the White House and Congress are active on this issue at the federal level. Companies have been able to use their legitimacy in the economy to help propel the STEM message forward. In raising awareness of the need for better STEM education, they have changed the discourse from improving teacher quality and educational opportunities for disadvantaged students generally to focusing on these issues in the STEM fields. Lastly, they have been successful in mobilizing resources through starting programs that later received government funding but also through inserting their STEM agenda into major federal education policies. Scholars have found general foundations to have acted as institutional entrepreneurs (see for example: Quinn et al., 2013; Thümler, 2014), here I argue that corporate philanthropy is also playing this role.

⁷⁴ Author's calculation based on CDU/CSU and SPD proposal (CDU/CSU/SPD, 2017, p. 5) with a list of federally funded STEM education initiatives.

Chapter 8: Comparison and Conclusion

Looking Back to Look Forward

From the outside, the desire among companies, especially those with high numbers of engineers and tech workers, to invest in STEM and MINT education seems like somewhat of a no brainer or to modify Bill Clinton's famous statement- "it's the *new* economy, stupid." But when one looks closer at how companies became involved in these movements it becomes clear that the *old* economy and the role companies have played in education and training have also had a major influence on the way they are involved in education today.

To get a more complete look at how corporate philanthropy in both countries ultimately came to support the STEM and MINT movements, I have compared three main dimensions in both countries for the time period starting in the late 1940s and ending with the present. One dimension is the role of business in education from both a vocational perspective but also from a philanthropic and societal perspective. A second dimension consists of ideas and influencing events in general K-12 and vocational education that likely impacted the way companies interacted with education institutions. The last dimension was the role of philanthropy and corporate philanthropy in education. More specifically, this includes the trends and happenings that likely influenced the opportunities available for companies and their foundations to be active in education.

I argue that the differences in corporate philanthropy we see today between Germany and the U.S. are largely due to the differences in the involvement of companies in education over time. Germany and the U.S. have traditionally had distinctly different skill formation systems (see Table 8.1) (Busemeyer & Trampusch, 2012; Thelen, 2004).

TABLE 8.1: CATEGORIES OF SKILL FORMATION SYSTEMS

Public Commitment to vocational training	Involvement of Firms in Initial Vocational Training		
		Low	High
	Low	Liberal Skill Formation (U.S.)	Segmentalist Skill Formation (Japan)
	High	Statist Skill Formation (France)	Collective Skill Formation (Germany)

Source: Busemeyer and Trampusch (2012). Table 1.1, page 12.

As before, Germany is still considered to have a collective skill formation system where companies invest and are heavily involved in the provision of vocational training (Busemeyer, 2009; Busemeyer & Trampusch, 2012; Thelen, 2004). Companies and their chambers or associates are still extremely active in the political debates surrounding vocational education. And just as they always have, they continue to push for minimal state involvement in the provision of firm-based vocational training. These are elements of company involvement that have remained sticky. This path dependency is clear when one looks at vocational education policy in Germany in the 2000s, many of the reforms that were in development in one way or another since the 1980s have evolved further through the Vocational Training Act of 2005 and the Training Pacts.

Looking at company involvement in vocational education however is just one side of the equation and deeply limits the overall perspective of how companies are involved in education overall. By broadening the view to include the philanthropic role of companies in general education, it becomes obvious that the early 2000s were not simply a time of small incremental changes in company involvement in vocational education but a major jump for many German companies into general education. Again, it is not that they abandoned their vocational education endeavors, but they did start to become active in K12 education policy.

Companies involved in dual vocational training are practicing a form of “implicit” CSR. Their participation in these systems is based on a set of norms and rules that are either legally required or expected by society and are part of a collective system of

actors working on vocational education (Matten & Moon, 2008, pp. 407-409). While this remains the case, many incremental changes within the dual vocational system but also within the general education system have allowed companies to become active in general education with “explicit” forms of CSR, where companies decide to act upon a social issue but at their own discretion, not as part of a collective (Matten & Moon, 2008, p. 409).

As German firms continue to chart a path into general education and into “explicit” CSR, the question is why companies started to become interested in giving to general K-12 education philanthropically given that they were already quite active in vocational education? Part of the answer lies in changes to the vocational system itself. Although the dual vocational system has remained largely intact, there have been many gradual changes both within the vocational system and outside of it, that have resulted in far bigger changes overtime⁷⁵ (Busemeyer, 2009). These changes include fewer companies participating in dual vocational training, ever more selective dual training programs that require a high level of preparation, an economy that values broader skill sets and knowledge, more students deciding to go to higher education, and a declining youth population overall (see for example: Baethge et al., 2007; Busemeyer, 2009; Jacob & Solga, 2015; Powell & Solga, 2008; Solga, 2009).

The increase in the percent of students going on to higher education makes the German system more like the U.S. system. In the sense that “College for All” which has long been an established policy goal in the U.S. seems to be growing in Germany as well (see for example: Baethge & Wolter, 2015, p. 104). With this development, is the German education system itself is becoming more like the system in the U.S.? Considering Table 8.1 and all of the theoretical work around the varieties of capitalism, I would argue that the German system of collective skill formation is becoming much more liberal because of the ways companies have approached this issue over the last two decades. As companies in Germany started to have difficulties finding trainees with the desired skill and knowledge sets in the early 2000s, they started to become more involved in general education issues. Up until the late 1990s or so, companies being involved in general education was considered taboo. Although

⁷⁵ The title of Marius Busemeyer’s book about vocational education in Germany translates to Change Despite Reform Congestion.

the companies had raised their concerns about the preparation of trainees, for many of them, it felt it fell on deaf ears until PISA came along.

PISA resulted in new actor constellations because of the way the results were associated with future economic outcomes and human capital prospects. This allowed for more interest groups and foundations to add their education agendas to the policy discussion (Höhne, 2015; Niemann, 2010, pp. 85). The connection between educational outcomes and economic ones also became prevalent (Höhne, 2015) and opened the door for corporate philanthropy to become active in general education. In the 2000s, the number of foundations active in education in Germany tripled, which included many new corporate foundations. Along with this increase, deeper partnerships with industry also developed (Hirsch et al., 2016; Junck, 2007; Striebing, 2017, pp. 24-25, 27, 35-36, 80-82). The connection to the economy also made industry groups much more relevant actors and provided them with the chance to become involved in the public debate about education (Hepp, 2011, pp. 86-90; Kreft, 2006, pp. 158-164; Raidt, 2010, pp. 96-98). The same was true for companies and their foundations. After PISA, their concerns were heard, which allowed for corporate philanthropy to become active participants in the general education policy debates.

Of course some companies had been involved philanthropically in general education far before PISA, but afterwards, the number of companies involved increased and their approach changed. In the late 1990s, companies that gave to education often did so by giving directly to a school booster club for a particular program. In the 2000s, corporate philanthropy shifted towards giving that was more strategic by focusing on leveraging their giving and on measurable outcomes. This led to many of them shifting their giving towards more nonprofits. Not surprisingly, this was also accompanied by a professionalization of corporate philanthropy itself within the big companies during this time. Other researchers have noted similar shifts within the German and European philanthropic landscape more generally (Adloff, 2010, pp. 401-402, 413; Mair & Hehenberger, 2014; Striebing, 2017, pp. 34-36). Companies, however, wanting to maintain their networks of influence, were shifting towards more corporate citizenship endeavors, including corporate foundations and giving but also lobbying and public relations (Speth, 2010, pp. 343-345).

The increased involvement of corporate philanthropic actors and the creation of education NPOs can be seen as creating a reproduction mechanism (Soifer, 2012, pp. 1574-1577). The new groupings of industry, their foundations, and other actors and the creation of new nonprofits focused on education provided companies with a new way to be influential outside of their traditional role in vocational education training and the policy that surrounded it. This is a new institutional avenue and represents a significant divergence in the way companies were active in education in Germany, which is an imperative aspect of a critical juncture (Slater & Simmons, 2010, pp. 888-890; Soifer, 2012, p. 1593). From a business perspective it also makes sense, once they have invested the time and energy in activities such as in professionalizing, in becoming knowledgeable in the education space, in building relationships with key players, it makes sense to continue to be active in that space because of the considerable startup costs involved (Pierson, 2000, pp. 257-259). This can also be seen as a new form of German collectivism with elites from large companies, top politicians, leaders of some unions, and foundations come together around a specific issue and decide upon the direction (Höhne & Schreck, 2009, p. 126).

It is not that big companies turned away from their role in dual vocational training and policy; in fact they were quite active and managed to achieve many of their long-term policy goals in the 2005 Vocational Training Act but also in the related training pacts and alliances they participated in (Busemeyer, 2011, pp. 15-17; 2015). Companies also created dual study programs to attract more students (BIBB, 2014) but this did not negate the belief that they can no longer depend on their traditional roles to secure social and human capital without also being active in education more generally (see also: Backhaus-Maul et al., 2010, pp. 18-20).

The U.S. is still considered to have a liberal skill formation system (see Figure 8.1) where the public commitment to vocational education is limited and there is little to no involvement among companies in the provision of initial vocational training (Busemeyer & Trampusch, 2012, p. 12). This has been the case throughout the entire post-war period and arguably still is; however as argued throughout this research, it is also important to look at the philanthropic involvement of companies in education for a fuller picture.

While companies had fought for less spending on education and less taxes up until the early 1980s, it was actually the decrease in taxes and the release of the *Nation at Risk* report that led to their philanthropic support of and advocacy for education starting in the 1980s. Since then, the American business community was a powerful voice for education reforms and philanthropically supported many initiatives (Mehta, 2013, pp. 103-104; Spring, 1997, pp. 397-399; D. Tyack & Cuban, 1995, pp. 33-34, 39). Companies and their foundations had been active supporters of the standards and accountability movement with their support of the ESEA Reauthorization of 1994. Their support of NCLB was simply a continuation of their support for this movement (Mehta, 2013, pp. 187,224-232; Spring, 1997, pp. 399-400) but they were also somewhat limited because of what was happening in vocational education. Coming off the heels of the 1990s, the School-to-Work program was not renewed because it was considered a flop due to low company engagement and did not result in the intended changes in vocational education (Hershey, 2003; Hershey et al., 1999). Furthermore, the 2006 renewal of the Perkins Act went in the direction of pushing CTE to be more focused on academics (Fletcher & Zirkle, 2009, pp. 502-503); which also discouraged ties with industry.

While the overall lack of involvement in vocational education and the philanthropic funding of K-12 education have long been evident and are path dependent, this research has also shown how corporate philanthropy has recently been used to fund vocational education initiatives. It has also shown how many of them are active in organizations that are pushing for more government funding for vocational education programs. While this is a nascent development, it begs the question if the skill system in the U.S. could move from a liberal skill formation system to something else given the increase in company and public support.

As much as corporate philanthropy has been the main way for companies in the U.S. to be active in K-12 education, there have been significant changes in their approach since the early 2000s. To understand why, it is necessary to look at what companies had been doing in the years preceding this time. After nearly two decades of investing in K-12 education and being active in education policy circles, there was no evidence of improvement and a growing sense of failure in education philanthropy at large (Colvin, 2005, pp. 23-31; Hess, 2005b, pp. 4-5; Reckhow, 2013a, p. 30) but also by

corporate philanthropy. Regardless, American companies and their foundations continued to support standards and accountability as the way to improve educational outcomes. What changed was that new actors, especially some of the civil right groups who joined them in their advocacy, pushed for additional reporting and accountability that would also show the differences in achievement by race, ethnicity, and poverty.

The passing of NCLB and the reams of data that followed it provided corporate philanthropic actors with new insights on the achievement gap and they refocused on initiatives aimed to close it. Around 2008 however, they did start to have concerns about the narrowing of the curriculum and students not having enough science and technology knowledge. While corporate philanthropy publically advocated for the reauthorization of NCLB, many were also active in education at the federal level outside of this process in the areas of science and technology education. In this way, the companies continued in their roles of working with the state on furthering standards and accountability policies while also addressing their concerns with the policies in other venues.

The main avenue of corporate involvement continued to be philanthropy but they started to work together more often and they changed their approach from giving to schools to giving to education nonprofits. By working together and not always trying to come up with their own initiatives, corporate philanthropy created relationships and networks they could rely on as other education situations arose. Joining forces with other foundations on some big projects can be considered a layering process (Streeck & Thelen, 2005, pp. 19-27). The companies and their foundations were still funding schools but they were increasingly funding nonprofits together with other foundations. So in effect, they were layering this on to their current work.

During the early 2000s there was a shift among the top education donors from traditional funders such as the Annenberg Foundation, the Rockefeller Foundation, and the Pew Charitable Trusts to a new set of funders, which included foundations such as the Gates, Walton, and Broad foundations. These new foundations were much more hands-on and preferred to fund nontraditional or innovative programs and charter schools instead of funding traditional education causes such as professional

development or curriculum, and were focused on outcomes (Hess, 2005b, pp. 5-6; Reckhow, 2013a; Reckhow & Snyder, 2014). Corporate philanthropy also started to invest in a more strategic way with a focus on outcomes. For many of them, this meant giving less to local schools and more to nonprofit organizations that could scale their initiatives better and were more flexible than school bureaucracies. For some companies, this meant investing in initiatives that were aligned with their competencies and needs because it gave them additional legitimacy. This is absolutely critical to corporate philanthropy as it must prove its value to the company and its shareholders but also to other societal actors active in the field (Himmelstein, 1997, pp. 3-6). This new logic led to a displacement process (Streeck & Thelen, 2005, pp. 19-27), where corporate philanthropy's role in education went from giving to schools directly to funding more education nonprofit and advocacy work with a focus on the education of poor and minority kids and the needs of the economy. These were seen as being better avenues to leverage their giving.

One could argue that there was a divergence in the ways American companies and their foundations invested in education in the early 2000s from more of a charity-based, school-centric model to one focused on impact and scalable results by investing in NPOs. I would argue however that corporate involvement in education in the U.S. did not experience a critical juncture during the early 2000s. Although all of the elements of a critical juncture were present, there was not a significant divergence in the role of companies in education; which is an important outcome of a critical juncture (Slater & Simmons, 2010, pp. 888-890; Soifer, 2012, p. 1593). In other words, companies had long been active in education philanthropically, all that changed was their approach. This is an obvious difference from the German case where companies that had traditionally been involved only in dual vocational training and had little to do with general education suddenly became much more active in general education. In Germany a new path was created, in the U.S. there was no new path; instead, there were more gradual changes or what Streeck and Thelen (2005) refer to as gradual transformation that continued throughout the decade (pp. 19-27). But what difference does it make if a critical juncture happened or not? The answer lies in what happens next, namely in the context of institutional entrepreneurs in a sub-policy paradigm.

Moving on to MINT and STEM Education

At first glance the STEM and MINT movements seem quite similar. In both cases, many actors adopted a common problem definition of not having enough high quality STEM and MINT education; which is detrimental to the economy. In both countries, there is a four-letter acronym that was used to bring together actors under a common brand. As explained on both sides of the Atlantic, this helped them to make policymakers and the public aware. As noted also on both sides, it is questionable if all of the actors are really working closely together but they see it as being to their advantage to be a part of the movement, so they remain. No one was really against the STEM and MINT education movements. Sure there were groups who argued that the focus was too narrow and was happening at the expense of other subject areas but for the most part, they were arguing more to join the brand and be a part of it, they were not against it. Basically, there are many elements of a policy paradigm because of the common problem definition that is tough to argue with, the change in the discourse that brought together many actors that may not have worked together otherwise, and the heightened awareness of the issue itself (Mehta, 2013, pp. 18-23).

I have argued that the STEM and MINT education movements are actually what I would call sub-policy paradigms. They are spinoffs of other paradigms but corporate philanthropy helped create the new movements, resulting in many of the same elements of a policy paradigm. In Germany it is an offshoot of the PISA paradigm, which was that the schools were failing, had huge inequities and if not addressed would decrease economic competitiveness. The MINT sub-policy paradigm was that the education system was not providing students with sufficient MINT skills and knowledge, which would hurt economic competitiveness. It was a narrower version of the PISA paradigm but with all of the same elements of a paradigm and that is what makes it a sub-policy paradigm. These corporate philanthropic actors did not completely change their stance towards education reform and policy but they chose to focus their efforts on the MINT areas of it.

The STEM education sub-policy paradigm meanwhile was a spinoff of the original standards and accountability movement that was started in the 1980s. It claimed the education system was failing and would lead to an economic catastrophe if more rigorous standards and accompanying accountability schemes were not adopted. This

movement continued through NCLB but there was a greater emphasis on the need to close the achievement gap in educational achievement and attainment (Mehta, 2013, p. 192). The STEM movement narrows this even further by identifying STEM education as lacking but especially for poor and minority students. As noted, it is not that companies and their foundations that support STEM rescinded their support for the earlier, more general standards and accountability movement; it is that they narrowed their focus towards STEM.

Policy paradigms allow for institutional change because they can cause institutions to view their responsibilities with a completely different lens (Mehta, 2013, pp. 19-20). An important aspect of a policy paradigm is that the amount of actual policy change can be shown (Daigneault, 2015, p. 43). Again, as with the presence of a critical juncture, in determining whether a policy paradigm occurred, it is important to determine the level of change that happened as a result of it.

In Germany, where PISA led to many companies becoming active philanthropically in general education, they could not lean on their years of experience to mobilize support for the MINT education movement. It takes time to build all of the connections and trust in a social field. Without PISA however, corporate philanthropy would likely not have been as active in K-12 education. Awareness for MINT education has definitely increased and there are many initiatives, but the Bundestag (German National Parliament) did not have a hearing regarding MINT education until 2017. A list from the governing coalition showed that although there were MINT education initiatives receiving federal funding, some of them were existing programs with a MINT component added on and most of them were receiving less than 10 million Euro per year (CDU/CSU/SPD, 2017). This does not suggest a huge change in federal policy or spending in education.

In comparison, in the U.S., there have been many STEM education policy discussions at the federal level in Congress and several related bills passed since 2007 (Gonzalez & Kuenzi, 2012, pp. 2-3) and multiple White House initiatives. STEM education has been weaved into the federal government's most comprehensive K-12 education law, the ESSA, as well as the RTTT competition ("Every Student Succeeds Act," 2015, pp. 195,217,224,243; U.S. Department of Education, 2009). While most of the

education policymaking happens at the state and local levels, the inclusion of STEM in federal education law will have an impact on how states and localities will use their federal funds and that is in turn likely to influence what they do at those levels (D. F. Smith, 2016). In addition, although an exact figure for the amount the federal government spends on STEM education is difficult to calculate, it is estimated to be between \$2.8 and \$3.4 billion (Gonzalez & Kuenzi, 2012, pp. 3-6). This is a completely different scale than Germany where federal spending on MINT education is likely less than 100 million Euro per year.⁷⁶ Of course not all of this spending is new, the point is that so many programs and so much funding is now included as part of STEM education in the U.S. This shows the weight of the STEM education movement: that policy makers see it as important to align to.

For the U.S., the lack of a critical juncture for corporate involvement in education after NCLB is part of the success of the sub-policy paradigm. The continuity allowed some companies and their foundations that were already active in K-12 education to continue to build on their networks of influence in the STEM education movement. Corporate philanthropy started to change their approach from giving to schools to giving to education nonprofits, which were seen as better avenues to leverage their giving. They also started to work together on some big projects. These changes in the role of corporate philanthropy in education happened through layering and displacement processes (Streeck & Thelen, 2005, pp. 19-27).

In effect although a critical juncture represents the start of a new road, which usually means a significant institutional change, roads take a while to build. In this case, the sub-policy paradigm of MINT education did not result in as many changes to education policy as the STEM case because the institution of corporate philanthropy in general education policy was not as developed. This furthers the point made by Streeck and Thelen (2005) that incremental change can lead to major change (p. 8).

In both countries corporate philanthropic actors can be seen as institutional entrepreneurs in STEM and MINT education. They were not only a part of these movements but seen by themselves and others as bringing groups of actors together,

⁷⁶ Author's calculation based on CDU/CSU and SPD proposal (CDU/CSU/SPD, 2017, p. 5) with a list of federally funded STEM education initiatives.

developing discourse strategies, and to differing degrees, mobilizing resources (DiMaggio, 1988, pp. 14-16; Leca et al., 2008; Thümler, 2014). That these corporate philanthropic actors are using their limited resources to channel public budgets towards STEM education initiatives is in line with what has been happening in general philanthropy recently. This is a shift in comparison to the former decades when they funded school and district initiatives directly and were not as involved in education policy endeavors (Clemens & Lee, 2010; Hess, 2005b, pp. 5-6; Reckhow, 2013a, p. 41; Reckhow & Snyder, 2014, pp. 187-188). What is interesting is that in both cases, the STEM and MINT movements are led by corporate philanthropy.

By developing a common language, framing the problem and raising awareness of the issue and potential solutions, institutional entrepreneurs are able to change the discourse around a topic (Clark, 2010, pp. 12-15; Leca et al., 2008, pp. 11-14). In both cases STEM and MINT education were framed as being insufficient to meet the demands of the economy and the acronyms themselves served as a common language among them. They have also been successful in raising awareness of the need for improved education in these areas for policymakers but also the general public. In both cases, solutions such as improving STEM and MINT teacher quality and providing disadvantaged students with more STEM and MINT education opportunities had support from a wide variety of actors.

A large difference in the solutions proposed is related to vocational education. In Germany, the vocational education aspect of MINT tended to focus on better preparing and waking the interest of students for MINT related dual vocational training programs. In the U.S. the focus for those active in CTE was on actually creating vocational programs. This represents a departure for American companies who have traditionally invested in K-12 and higher education but not in vocational training. As concerns about specific skill shortages have arisen however, some companies have used philanthropy to pilot vocational programs for middle-skill jobs, especially in the STEM fields where the shortages have been the greatest.

This difference makes sense given the roles companies have played in the provision of dual vocational training. Of course German companies did not need corporate philanthropy to start new vocational programs. They had the mechanisms for that but

they did need to set up new programs to ensure that more students would be prepared for them. For most of the American companies however, the new foray into vocational education represents a minor change that could lead to more significant changes down the road (Streeck & Thelen, 2005, p. 8). If the Blueprint for Transforming CTE put forward by the Obama administration (U.S. Department of Education, 2012) with the support of the business associations continues to gather support, there may be additional opportunities to support a stronger tie between industry and vocational education. There are already signs of a continued interest in having more company involvement and support for high school apprenticeships in the Trump administration. Or as President Trump said "We want a future where every high school in America offers apprenticeship opportunities for young citizens" (Gewertz, 2017).

Although my hypothesis was that German corporate philanthropy would not invest in vocational education philanthropically, it turned out to be wrong. The MINT, as well as, the STEM movement has been mainly addressed towards the academic side of education, or those going on to university. Some German companies however are using philanthropy to encourage immigrant students or students more generally to consider MINT-related dual vocational training programs. This is driven by their concerns of not having enough qualified people for these programs. Also, much of the interest in MINT education for general education comes from concerns about trainees who are not well prepared in these subjects. By investing in MINT education, German companies can maintain their long-term standing of being a partner in solving education and training issues, without having to take on additional apprentices as they did in the past.

In both cases, there was a belief that the state was unable to fulfill a role in the chain of vocational education so corporate philanthropy needed to step in to do so. Unlike many of the traditional operational foundations in Germany that would have done this by acting as subsidiaries of the state, the corporate foundations involved in the MINT movement were creating their own programs. This is a classic example of a liberal foundation model that can be seen as creating parallel systems to government and providing alternative options to the mainstream. (Anheier & Daly, 2006b, pp. 17-20,

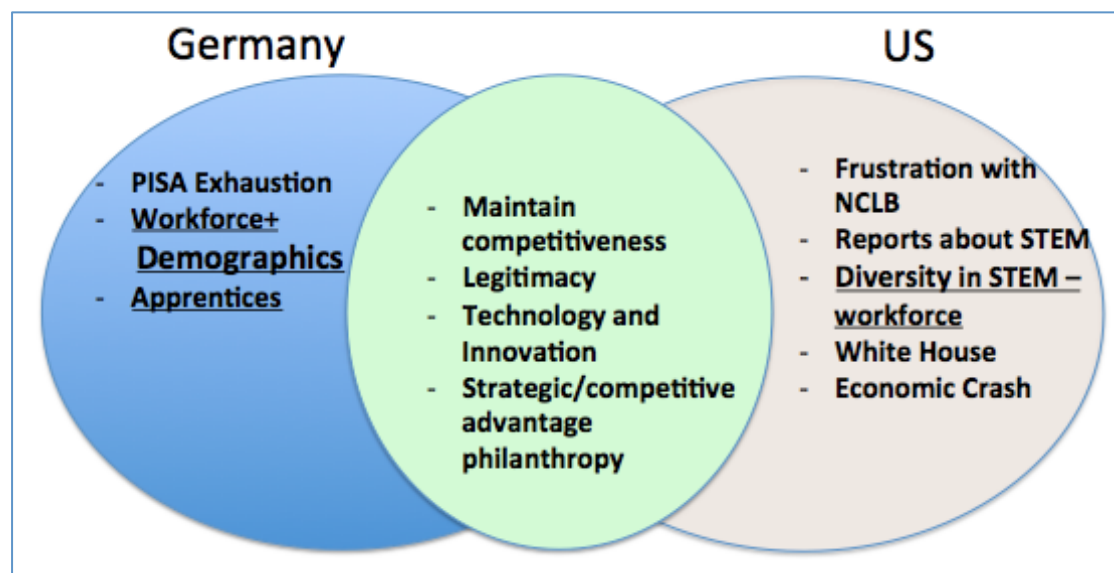
50-52). The liberal model has been increasing in popularity in Germany (Adloff et al., 2006) and continues to be popular in the U.S.

In sum, acting as institutional entrepreneurs corporate philanthropy in the U.S. and Germany were able to create the sub-policy paradigms of the need to improve STEM and MINT education. The degrees of their success in creating institutional change in the education policy landscapes and the solutions proposed by corporate philanthropy in each country however, were bound by the historical roles of companies in K-12 education.

Ideas and Influences Leading to MINT and STEM Education

It is critical to understand the ideas and influences that drove companies and their foundations to become institutional entrepreneurs in MINT and STEM education. When looking at the STEM and MINT movements from the outside, and even going through some of the interview responses, there are some similarities for sure but there are also considerable differences.

FIGURE 8.1: SIMILARITIES AND DIFFERENCES OF IDEAS



I will start here with the similarities or the middle circle of figure 8.1 above. A common idea among the companies and their foundations in the two countries was a sense of having more legitimacy in the STEM and MINT education subjects because of their industries. This is an important point because for foundations in the education field, only those seen as legitimate have a chance to influence the discourse (Kolleck

et al., 2015, pp. 803-804). The same is true for corporate philanthropy, which in the cases of STEM and MINT education, lean on the competencies of their industries. Corporate philanthropy must maintain its legitimacy across several organizations and multiple actors of the societal sector of interest (Gerber, 2006, p. 9; Himmelstein, 1997, pp. 3-6). STEM and MINT education were seen as almost a natural fit because the companies involved could bring their competencies to the cause, they had large networks of key actors, other actors saw them as innovative, and because they were such big economic players. In this sense companies felt they had a legitimate reason to invest in STEM and MINT and felt legitimate with regards to these subjects areas. This helped them win approval from many stakeholders.

For the German companies this was a new found legitimacy because according to some of the experts, prior to the early 2000s it was considered taboo for companies to be involved in general education. This mirrors the argument about CSR becoming more explicit in Europe. Companies have traditionally been engaged through mandatory and customary requirements in a collective system or implicit CSR that does not come with any branding but is simply expected in society. As more social needs arise and are seen as being unaddressed, they become opportunities for companies to take on responsibilities but in a more explicit way (Matten & Moon, 2008, pp. 407, 415-417). For the Americans however, there was also caution in explicit CSR. As some of the experts mentioned, one of the reasons STEM education was attractive was that it was considered a safe investment. It would not lead to protests in the streets or worse yet, boycotts. By investing in STEM education they can build profitable partnerships that are seen as uncontroversial and valuable to society. This is especially important in the U.S. where philanthropy has been viewed more skeptically than in Germany (Adloff, 2010, p. 417).

Related to their roles in the economy and their legitimacy in the STEM and MINT movements are the concerns about long-term innovation, economic competitiveness, and the workforce. One of the most common threads that ran through all of the interviews was the idea that companies needed to invest in STEM and MINT education in order to be relevant in the economy of the future, which is on its way to a level of digitalization we have never seen before. The idea time and again was that the

countries with the best and most digital skills would be the economic winners of this century and that those who did not invest in these areas would fall behind.

The idea that corporate philanthropy needed to become more strategic was strongly present both countries. This led to a focus on impact and scalability or as some experts explained, needing to prove a return on investment. In both countries, this resulted in giving less towards schools or their booster clubs and more to nonprofit organizations they felt would have more leverage. STEM and MINT education as policy issues were perfect conduits for this type of investment because the subject areas are aligned well to the competencies of the companies involved. In this sense STEM and MINT were easy for them to build on but could also result in more people with in-demand skills. This aligns with the push for companies to use their philanthropy towards their competitive advantage. Porter and Kramer (2002) maintain that businesses can address some of society's most difficult issues through corporate philanthropy while increasing their competitive advantage at the same time. Companies are best suited to identify the strongest grantees, bring together other funders, improve the performance of grant recipients, and to put the best practices into wide-spread use (Porter & Kramer, 1999, 2002). They also serve as a bridge for the company into many other areas of society, again giving them more influence (Adloff, 2010, pp. 396-398; see also: Gerber, 2006, pp. 17-18). Taking part in debates in education allow foundations to increase their discursive power and their social influence (Kolleck, 2015, pp. 6-7) and the same can be said of corporate philanthropy.

Whether investing in K-12 STEM or MINT education will actually lead to measurable advantages for a company is questionable. One reason is that there is usually a long period of time between when one is in school and when they are actually acquiring skills that are directly marketable. Secondly, while there are a lot of meaningful and impactful STEM and MINT projects in K-12 education, it is highly unlikely that these projects will result in newly skilled employees for any given firm. Investing in STEM or MINT at the K-12 level therefore has more of a classwide rationality because it is driven by the long-term needs of business and society as a whole (Himmelstein, 1997, pp. 30-34). The exception to this of course are the U.S. companies who are investing in creating CTE programs that they can later recruit from. This is more of company rationality (Himmelstein, 1997, pp. 31-35) and can be

seen as taking the idea of competitive advantage philanthropy in the context of STEM a step further. By focusing on the their need for more people with a specific set of skills, which is of utmost importance to them, companies are providing value for their philanthropic activity while addressing a social need of providing a new pathway to careers (Porter & Kramer, 2002, pp. 14-15).

A key difference in the influencers between the two countries was the use of the executive office. Although I showed that both President Obama and Chancellor Merkel had showed their support for MINT and STEM education, there was a stark difference in the amount of support they showed. President Obama, from early on in his presidency until the end, used the bully pulpit of the White House many times to highlight the importance of STEM education. This influenced CEOs, regardless of political party, to engage more in STEM education initiatives. President Trump has also shown an interest in STEM education, recently saying that he wanted the Department of Education to spend \$200 million per year on STEM education. According to him “Greater access to STEM (and) computer-science programs will ensure that our children will develop the skills they need to compete and to win in the workforce” (Balingit, 2017). Chancellor Merkel, a staunch supporter of MINT since 2008, especially for girls, has not used her office (or her budget) nearly as much to push for MINT education. One could argue that the executive branch at the federal level does not matter as much in education, however leadership at this level is critical in laying a direction and setting a tone for national education priorities. The involvement of the President or the Chancellor in the STEM and MINT movements does not imply that they are leading it but their participation in it further influences other actors, including other companies and their foundations to become involved.

Ideas about demographic changes and what they mean for the workforce were very influential for companies deciding to support STEM and MINT education but there was a significant difference. In Germany there was an overall concern about demographics and more specifically, big concerns about a declining youth population. This theme was weaved into every expert interview at multiple points. One of the experts (GI2M) even referred to an upcoming “war for talent.” For the companies, the idea that there will not be enough workers now or in the future with the MINT skills and knowledge they desire was a driving reason to be involved. There are

initiatives focused on getting girls' and immigrants on the MINT train because they are currently underrepresented and could help fill the expected gap but for many of the experts, it was critical to interest as much of the youth population as possible. This was especially the case for the dual vocational training programs, which were struggling to maintain significant interest among high-performing youth and suffering a bit of an image problem.

In the U.S., the demographic concern did not have to do with the overall youth population but with underrepresented populations. NCLB brought the achievement gap to light along with demographic data that showed the U.S. was becoming a minority-majority country. Companies saw it in their best interests to support programs with a goal of improving access for poor and minority students to increase the size of the workforce with a solid STEM knowledge base.

In Germany there was a sense of PISA exhaustion that also led to investing and focusing on MINT. While the PISA Shock of the early 2000s was a burning topic at the time, 2008 or so, it was starting to fizzle. This was evident in the interviews but also in the data about the number of articles about the topic of PISA (see chapter 6). Companies and their foundations saw the need to move on to supporting something more aligned with their needs and competencies rather than generally supporting the improvement of education. In the U.S., corporate philanthropic actors started to severely question the logic of NCLB's accountability emphasis on reading and math at the expense of science and technology. They started to actively engage in new committees and form organizations to get their interest in STEM education into the reauthorization of NCLB (now known as ESSA) and in various other programs.

Specific reports about the need for STEM education were influential for corporate philanthropic actors in the U.S. The PISA results showed that student performance was below the OECD average and ranked at 21⁷⁷ of 30 OECD countries for natural sciences (OECD, 2007a, p. 2). Data from PISA and other assessments were used in reports that garnered significant attention about the potential effects on the economy. Several of the interviewees mentioned the same set of reports; which shows that the

77 Ranked at 21 but the confidence interval extends from the 18th to the 25th rank

reports coming from scholarly and advocacy research units (see: Campbell & Pedersen, 2010) likely influenced corporate philanthropy to become active in STEM education. Despite the poor performance, there were also reports that showed that the U.S. was producing more than enough college graduates in the STEM areas but that many of them found employment outside of these fields. The perception has been that students in the U.S., but especially those coming from poor and minority families, have been performing poorly and this will lead to an economic catastrophe if it is not addressed. This raises a couple of questions: isn't it something about the work itself? Should companies be spending more of their time and money on solving the problem of making STEM professions more attractive? Will focusing on STEM education for disadvantaged students bring much if most of them also decide not to remain in the STEM fields?

In Germany only PISA results and the reports surrounding them had an influence on the companies. When asked to name other reports, none were mentioned. While most people think of the PISA shock that started in late 2001, it turns out that the PISA results released in late 2007 with a focus on natural sciences, also had an effect on companies deciding to fund MINT. Although German students performed above the OECD average and ranked seven⁷⁸ out of 30 OECD countries, (OECD, 2007b, pp. 2-3) the perception was that they did not do well overall. There were however significant gaps in achievement for students coming from disadvantaged families and while this was a factor in investing in MINT, for the experts it was not the leading concern. Only one of the experts mentioned the accompanying OECD survey results, which revealed that many German students did not see the natural sciences as relevant to their lives or something worth pursuing in their future careers. Actors tend to react to what their perception of the problem is even if it is actually something else (Hay, 2011, pp. 72-74). The perception of poor performance in science may be driving companies to invest in programs that do not address the relevance of the MINT subjects and the ties to careers that is needed.

Taken together, as with all movements, there were influential ideas that drove corporate philanthropy to be active in STEM and MINT education. In both countries

78 Ranked at 7 but the confidence interval extends from the 7th to the 13th rank

investing in these causes was seen as a way to address some of their largest workforce issues. Demographics were also key drivers. In Germany, where low birthrates led to a decline in the youth population and the academic demands for trainees continued to increase, the companies saw improving and increasing MINT education as a way to help with the shortages in these areas. In the U.S., the focus was more on the need to diversify the STEM workforce and that improving STEM education for minority populations would help to address this. Concerns about innovation, digitalization, and being economically competitive were lead drivers of their interest. There was a firm belief that countries with the most advanced skills in the STEM subjects would be best prepared for the challenges of the high-tech world of tomorrow. Corporate philanthropy believed that the state needed to do more to ensure high levels of skills in these subjects. As companies with expertise in these areas, they believed it was in their interests but also the interests of the country to push for STEM and MINT education. The ideas that corporate philanthropy should be strategic by focusing on leverage and outcomes aligned well with the trends in philanthropy more generally. In the corporate case the idea of better aligning philanthropy with the expertise of the company also played a role. For both Germany and the U.S., the ideas were also bound to the past roles the companies have played in education.

Conclusion

Corporate philanthropy is involved in the STEM and MINT education movements because the traditional roles these companies have played in education are seen as losing their relevance and thereby, their influence. Companies in both the U.S. and Germany have continued their traditional roles in education but have had to adjust to changes in the educational and in philanthropic fields. These changes have caused corporate philanthropy in the two countries to become more similar and have allowed for companies and their foundations to become institutional entrepreneurs in STEM and MINT education.

In Germany, the education system went through some major changes in the 2000s so it is not surprising that the role of companies in K-12 education also changed. The PISA shock reverberated throughout Germany, not just because of the results but because of concerns for the long-term health of the economy that were attached to it.

While PISA allowed for companies to become active in K-12 education, it also brought about reforms that led to more students going on to university. Ultimately this led to less than 50 percent of students going into dual training programs at the same time that these programs were increasingly looking for students with higher academic skills. The companies continued to be active in the vocational education policy debates and won key provisions such as the inclusion of two-year training paths and more flexibility. These activities did not solve their issues of needing more highly skilled workers especially as the youth population was in decline. With the majority of students no longer opting to go the dual vocational route, companies and their foundations started to invest philanthropically in K-12 education, just like their American counterparts who traditionally have only had a general education route to invest in.

At the same time Germany was undergoing many educational changes, so was the philanthropic landscape. The number of foundations active in education increased tremendously, including many new corporate foundations. CSR was also growing in popularity and with it, corporate philanthropy. As the number of foundations grew, so did professionalization, especially among the larger foundations and with it, a focus on being more strategic in their giving. Whereas foundations in the late 1990s and early 2000s were more focused on charitable giving, philanthropy in the late 2000s was moving in the direction of strategic giving by focusing on measurable outcomes and ways to leverage their giving. For those who were active or became active in education in the 2000s, the focus on being more strategic resulted in funding more NPOs and less schools (or their booster clubs) and better aligning with the expertise of the company where they could also have more legitimacy. There was much more emphasis on leveraging their funds but also their expertise. Nonprofit organizations with greater reach were seen as a way to do this.

Corporate philanthropy in the U.S. had many of the same trends, with a rapid increase in philanthropic funding in education and a shift from what some would call charitable giving to more strategic philanthropy. In practice, as with the German companies and their foundations, this resulted in funding initiatives with the expectation of measurable outcomes and a focus on scalability and thereby, redirecting some of their funding from schools to NPOs. Unlike Germany, corporate

philanthropy was not new to funding K-12 education and being active in education policy debates. In the U.S companies had long been involved in K-12 education through philanthropy but they were tired of investing K-12 education without seeing results.

Companies in the U.S. started off the 2000s supporting K-12 education more generally by putting their weight behind NCLB and furthering the standards and accountability movement and by supporting schools and districts. The data and reporting of NCLB led to a focus on the achievement gap between poor and minority student and their more advantaged peers. Although the data led to some corporate philanthropic actors redirecting their funds to programs aimed at underserved minorities, some companies became concerned about the detrimental effects of NCLB's accountability for math and English at the expense of science and technology and to CTE. They started to join committees and other policy networks outside of their general K-12 commitments to advocate for the inclusion of more science and technology, which were more aligned to their expertise and their needs as companies.

The idea of better alignment also drove some American companies and their foundations to become more involved in vocational education by developing their own programs. This is of course something their German counterparts did not need to do but in the U.S., some companies started to see it in their best interest to develop training programs that could more directly address their workforce issues. This was also a welcomed development due to high youth unemployment rates and the lack of a focus on the middle-skill labor market. The step into vocational education represented a diversion for American corporate philanthropy, which had traditionally been involved in K-12 or higher education. While this is a diversion, it is important to note that the diversion happened within corporate philanthropy itself, it is not a completely new path. This is new for most of the companies involved and whether it will become institutionalized remains to be seen and depends on the willingness of companies and their foundations to advocate for it.

In both the U.S. and Germany investing in STEM and MINT education made sense for big companies with workforces that are science, technology, and engineering heavy. These companies and their foundations could lean on their legitimacy as large

economic players in these fields to become institutional entrepreneurs. In doing so, corporate philanthropy acted as institutional entrepreneurs to bring together actors from the corporate, philanthropic, nonprofit, education, and state sectors. They were able to bring companies together that usually would not have as much in common such as chemical and technology companies but also teachers unions and education leaders. They were also able to bring in supporters of the different subject areas. They brought them all together and used a one-syllable acronyms to create messages about improving STEM and MINT education as a way to improve the workforce, to be more innovative, and to remain economically competitive. They were able to create sub-policy paradigms even though the ideas and perceptions driving corporate philanthropy in the two countries differed in many ways.

In both cases, the recent moves to more strategic and aligned philanthropy and funding more NPOs and advocacy organizations paved the ground for the STEM and MINT education movements to take root. For corporate philanthropy in the U.S., this was a change in approach to K-12 education but they could still lean on their expertise in education policy and their networks to ensure new laws and additional funding at the federal level. In Germany, investing in K-12 education was still somewhat new. Corporate philanthropy could not lean on thirty years of expertise in K-12 education to propel the MINT movement towards big policy wins but have raised awareness at the federal level and have some wins (and lots of activities at the state and regional levels).

Below are continuations of tables 4.1 and 4.2 in the historical chapter to sum up the changes that have happened in the 2000s in relation to the role of business in K-12 education, major relevant happenings in education, and trends in general and corporate philanthropy. The 1980s-1990s columns are the same as they are Chapter Four but are included here to show the changes that happened.

TABLE 8.2: SUMMARY GERMANY THROUGH THE 2000S

1980s-1990s	2000s
Business/Industry Roles and Positions in Education	
<ul style="list-style-type: none"> • Provision of VET, but declines in 90s • Support policies to make VET and academic education recognized as equal • Start of CSR • Growth of corporate foundations- some interest in K-12 education 	<ul style="list-style-type: none"> • Continued provision of VET but fewer companies involved • Support Ausbildungspakt and Vocational Training Act, especially flexibility provisions and 2 year VET • Increasing requirements for dual VET • Create many dual study programs • Major growth of corporate foundations with many active in K-12 education • Active in K-12 education after PISA and more socially accepted
Education System Themes	
<ul style="list-style-type: none"> • Limited state intervention in dual vocational training- more business control • Attempts to make VET attractive to <i>Abituren</i> • Some experiment with policies to change tripartite structure • Support idea of differentiated VET profiles • Growing role in provision of VET for special needs • Growing role in supporting VET in “new” Länder • Participation in international tests 	<ul style="list-style-type: none"> • PISA shock • Many general education reforms/ including secondary reforms • Large increase in students going to postsecondary, percent of students going to VET dips below 50% • State providing VET for large percentages via transition system and vocational schools and paying for some additional training places • Vocational Training Act 2005 passed, includes flexibility provisions and differentiation • Decrease in size of youth population
Philanthropy and Corporate Philanthropy Trends	
<ul style="list-style-type: none"> • Foundations boom starts in 1990s • Some corporate foundations with K-12 education • Corporate foundations grow/CSR ideas take root • Investing in school-based initiatives 	<ul style="list-style-type: none"> • Foundations boom even more • Tripling of number of foundations active in K-12 including corporate foundations • CSR style corporate foundations grow • More liberal style foundations • Focus on strategic philanthropy grows, focus on outcomes, leverage of investments/more professionalized • Investing in NPOs, less in schools, more in advocacy/more aligned with company expertise • Corporate philanthropy as institutional entrepreneurs, MINT is example

TABLE 8.3: SUMMARY U.S. THROUGH THE 2000S

1980s-1990s	2000s
Business/Industry Roles and Positions in Education	
<ul style="list-style-type: none"> • Limited provision of VET through work-based learning partnerships • Some advocated for more practical VET • Policy influencer local, state, and federal education after <i>Nation at Risk</i> • For standards-based reforms/more edu spending • School-Business partnerships/Model schools • CP- doubled and long-term commitment to K-12 edu 	<ul style="list-style-type: none"> • Continues to be education policy influencer, advocates for NCLB • Continues to be for standards and accountability • Concerned about curriculum narrowing during NCLB, science and technology education left out • Narrowing of interests for some companies- specific to industry • Renewed interest in VET, some create their own programs/still limited • Support better industry connection to VET • Supportive of ESSA, including STEM provisions
Education System Themes	
<ul style="list-style-type: none"> • State standards and assessments adopted for ESEA funding • Federal role becoming more prescriptive • Promotion of Model Schools- reformed schools with new designs and plans • Push for national standards but ended up with state standards • Start to emphasize academic skills in VET • STWOA- work-based learning but did not reauthorize 	<ul style="list-style-type: none"> • NCLB passed, increased requirements for standards and assessments/ accountability/increased federal role • Data reporting including subgroups, leads to much more specific data • Achievement gap becomes theme • RTTT competition, states sign on to many more reforms • High youth unemployment • Carl Perkins renewal of 2006, emphasis on improving academics in CTE and postsecondary • Blueprint for CTE, calls for more industry involvement • More emphasis on VET from federal government/Obama • Passing of ESSA (old NCLB), which included STEM elements
Philanthropy and Corporate Philanthropy Trends	
<ul style="list-style-type: none"> • Supported reforms, research, and advocacy but also school districts directly • Annenberg Challenge- seen as ineffective • “New” funders with alternative approaches/ advocacy enter the field 	<ul style="list-style-type: none"> • Frustration with K-12 investing • Change from traditional philanthropists to “new” funders/ influx of funding to education • Focus on being more outcomes driven and strategic/leverage • Even less giving to schools, more to advocacy organizations and NPOs

	<ul style="list-style-type: none"> • Economic crisis leads to less money for corporate philanthropy- needs to be more focused • Idea of competitive advantage philanthropy - align giving better to company expertise and needs of company • Corporate philanthropy as institutional entrepreneurs, STEM, working together
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Contributions Limitations and Additional Research

Although this is a long dissertation, much more research on the role of corporate philanthropy is needed and fits well within the body of growing research about the privatization of education. (see for example: Henig, 2008; Koinzer, Nikolai, & Waldow, 2017; Levin, 1991). This research is especially relevant to some of the more recent research about the roles and interests of the state and private actors in educational governance (see for example: Fusarelli & Johnson, 2004; Herbert Altrichter, 2007; Mehta, 2013; Meyer & Benavot, 2013). At its core this study is about corporate philanthropic actors associated with powerful companies that are influencing the governance of public education. It is a call for the need to evaluate companies and their foundations as active actors in educational governance but to look at the overall picture of their involvement in education and with a focus on how their past involvement influences or shapes their current involvement.

As shown here and in other publications, it is not the amount of money in philanthropy that matters, it is how it is used. Most research however, is focused on the foundations that give away the most funding in a given year or are the overly loud voice on an issue. Much more attention needs to be given to influence and the networks of philanthropy. This is even more the case for corporate philanthropy of big companies, which can also lean on their industry connections and their economic legitimacy for influence. The evaluation of philanthropy in education should separate out corporate philanthropy from general philanthropy because, as I have shown here, their interests may be different and tied to the parent company.

This research was focused on some of the largest and most well known Global Fortune 500 Companies in the two countries. Additional research is needed about the role of corporate philanthropy in education of small- and medium-sized companies. Do they have nearly the influence? More perhaps at the local level? What types of initiatives do they invest in? Are the initiatives also aligned with company needs and strategy?

Similarly, this research is focused on big companies; which were actively investing in STEM and MINT education. Research about corporate philanthropic investment in other areas such as environmental education or early education or literacy is also needed and would further answer the question about what drives companies and their foundations to be active in education.

As educational outcomes are increasingly tied in policy discussions to economic outcomes, companies have been invited to join the conversation and to take more active roles in education policy. Companies and their foundations are acting on this legitimacy and promoting their agendas, sometimes as in the case of STEM and MINT education, they can create a sizable political force. As the U.S. and German cases have shown with the *Nation At Risk* and PISA, once the business community becomes active in education and are seen as valuable members of the education policy community, they are likely to continue to be active in education. It makes sense; they have invested money and resources and have built up their networks of influence. They are not going to back away from that. From a research perspective this means that many more opportunities to find how corporate philanthropy is influencing education will present themselves. Given the influence companies and their foundations can have, it is well worth our time.

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Appendices

Appendix A: Abbreviations

ABB	Arbeitsstelle für betriebliche Berufsausbildung
QCA	Qualitative Content Analysis
AFT	American Federation of Teachers
APIFG	Ausbildungsplatzförderungsgesetz
ARRA	American Reinvestment and Recovery Act
AYP	Adequate Yearly Progress
BA	Bachelor's Degree
BBF	Bundesinstitut für Berufsbildungsforschung
BDA	Bundesvereinigung der Deutschen Arbeitgeberverbände
BDI	Bundesverband der Deutschen Industrie
BGJ	Berufsgrundbildungsjahr
BMBF	Bundesministerium für Bildung und Forschung
CC	Corporate Citizenship
CDU	Christlich Demokratische Union
CSR	Corporate Social Responsibility
CSU	Christlich-Soziale Union
CTE	Career and Technical Education
DDR	Deutsche Demokratische Republik
DGB	Deutsche Gewerkschaftsbund
DIHK	Deutscher Industrie und Handelskammertag
ECS	Education Commission of the States
EOA	Economic Opportunity Act
ESEA	Elementary and Secondary Education Act
ESSA	Every Student Succeeds Act
ETS	The Education Testing Service
EU	European Union
EVPA	European Venture Philanthropy Association
FAZ	Frankfurter Allgemeine Zeitung
FDP	Freie Demokratische Partei
i3	Investing in Innovation Fund
IRS	Internal Revenue Service
JFF	Jobs for the Future
K-12	Kindergarten through Grade 12
KMK	Kultusministerkonferenz
MINT	Mathematik, Informatik, Naturwissenschaften, and Technik
NAEP	National Assessment of Educational Progress

NASDC	New American Schools Development Corporation
NCLB	No Child Left Behind
NEA	National Education Association
NPO	Nonprofit Organization
NSF	National Science Foundation
OECD	Organisation for Economic Co-operation and Development
P-Tech	Pathways in Technology Early College High School
PISA	Programme for International Student Assessment
RTTT	Race to the Top
SPD	Sozialdemokratische Partei Deutschlands
STEM	Science, Technology, Engineering, and Technology
STWOA	School-to-Work-Opportunities Act
TIMSS	Third International Mathematics and Science Study
TP	Traditional Philanthropy
VET	Vocational Education and Training
VP	Venture philanthropy
ZDH	Zentralverband des Deutschen Handwerks

Appendix B: Supporting Data

STEM Education and MINT Bildung Search Results

Time Frame (Yrs)	“STEM Education” Search Results		“MINT Bildung” Search Results	
	NYT*	Google	FAZ**	Google
01.01.2001-01.01.2005 (4)	0	7,600	4	30
01.01.2005-01.01.2008 (3)	0	14,800	2	22
01.01.2008-01.01.2010 (2)	0	22,400	22	69
01.01.2010-01.01.2011 (1)	7	19,700	10	72
01.01.2011-01.01.2012 (1)	1	30,300	13	81
01.01.2012-01.01.2013 (1)	4	39,500	10	171
01.01.2013-01.01.2014 (1)	11	64,700	15	318
01.01.2014-01.01.2015 (1)	7	103,000	9	452

*New York Times (NYT)

** Frankfurter Allgemeine Zeitung (FAZ)

Notes: The search for “STEM Education” (with parantheses) was conducted on February 23, 2015 using the search page of the New York Times Website, www.nytimes.com using the specific dates and using the advanced search function of Google which also allowed for the same specific date ranges. The same process was used for the search term “MINT Bildung” using the search page of the Frankfurter Allgemeine Zeitung, www.faz.net on September 21, 2016.

The searches were conducted on two different dates because I started looking at STEM data first to get a sense of when the usage of the acronym picked up for the purpose of my interviews and noted that MINT had a similar timing for the increase but I used the data in preparation for the interviews. Later I decided to actually include it in my findings and needed to do a comparable search.

Appendix C: Similar German and English Words with Different Meanings

As part of my studies I came to realize that there are some words in German and English relating to education that are extremely similar but have different meanings. I have included them here along with a couple of short names that sometimes bring confusion.

Word	English Meaning (American)	German Meaning
Kindergarten	First year at public school, in most states is not mandatory but almost everyone attends. Starts usually at or around age 5	What Americans would refer to as preschool. Covers ages 3-5/6. Is separate from the school.
Student	Anyone from age 2 through higher education who is attending an education institution	Higher Education students only. Grades 1-12 are referred to as Schuler
High School	Comprehensive Secondary School	Note: not Hochschule
K-12	Refers to all schools, does not include higher education institutions	Closest to Allgemeine but also includes five-year-olds
Azubi	Do not really have this word but closest would be an apprentice	Nickname for apprentices in dual vocational training, short for Auszubildende/r

Appendix D: Interview Questions Germany

Before Start:

- STEM has become a huge buzzword in **K-12**⁷⁹ education and economic circles in the U.S. while in Germany it is MINT. Many major corporations and business organizations are playing lead roles in the STEM movement through their philanthropic contributions and by lending their voices to the movement. Likewise, there are many organizations that support MINT education at the local, state, and federal levels in Germany.
- Although there is significant corporate philanthropic interest and involvement in STEM/MINT education in both countries, there is a lack of research about it.
- Looking at this through American eyes where the German system with its well-known vocational system is forever touted as the way to avoid skill shortages and mismatches, I cannot help but ask my main research question: ***Why and how did corporate philanthropy in Germany and the U.S. become active in similar MINT and STEM initiatives even though their education systems are quite different?***
- *I spent the last few months researching the history of corporate philanthropy and involvement in education since 1945 but I am conducting interviews to learn more about recent movements in corporate involvement in education with a focus on MINT/STEM.*
- Anonymous
- Recorded only with your permission and for my use only for transcription
- Happy to share my research

GERMANY

General Questions:

- A) How would you and your firm define corporate philanthropy?**
- B) Why is K-12 education and important investment field for corporate philanthropy?**

Total of 6-12 main questions!

Was there a PISA critical juncture for corporate involvement in K-12 education? (Critical juncture and gradual transformation)

- 1. How has Corporate Philanthropy developed or changed among Germany's largest companies over the last 25 years?**
 - a. ***Please compare for me the role of corporate philanthropy in education in the 1990s versus the time since 2000. There seems to be major growth in CP as evidenced by the founding of Corporate Foundations.***
 - i. *Move towards more strategic philanthropy*
 - ii. *A need to be more tied to corporate strategy overall*
 - iii. *Growth and professionalization of the sector?*
 - iv. *Other*
 - b. ***What do you see as the major drivers of change in corporate philanthropy generally since the 1990s?***
 - c. ***What about in the area of elementary and secondary education?***
 - i. ***How did the approach that corporate philanthropy took in education change? (funding schools, NPOs, awareness,***

⁷⁹ K-12 Education refers to elementary and secondary education (kindergarten through grade 12)

increase in K-12?) Were these approaches in addition to their traditional funding priorities or did they replace them?

ii. What were the major influences for these changes?

- 1. Change in political make-up*
- 2. National focus on early education*
- 3. PISA results*
- 4. Other*

2. IF PISA is mentioned

- a. When did this time of big awareness and focus on PISA start and end?*
- b. How did PISA change the way companies approached or funded education?*
- c. Did PISA change the alliances of groups working in education?*
- d. Corporate philanthropy had been on the rise since the 1990s, before PISA, what other issues were corporate philanthropy interested in investing in the early 2000s? (contingency)*

3. What about Vocational Education- from an American Perspective, it seems like German companies that participate in the Dual Ausbildung system would have little incentive to invest philanthropically in education when they are already spending so much on vocational education (*Berufsausbildung*) and already have considerable influence in education policy. ***With this in mind and from your perspective, why has the practice of giving to K-12 education through corporate giving and corporate foundations increased over the last decade? Is it at all related to changes in the Dual Ausbildung system?***

- a. Declining participation of firms*
- b. Concerns about apprenticeship readiness*
- c. Declining interest among students*
- d. Other*

4. Tell me about the immediate years after the PISA Shock. How did corporate philanthropy become involved or change the way they were involved in education?

- a. What were they funding?*
- b. How were they working together?*

How and when did the idea for MINT Education come into play? (ideational theory, gradual transformation, and discursive strategies)

IF PISA

Immediately after PISA and in the years following, there was no mention of MINT education in annual reports, the press... the interest in MINT did not really come into play until 2009 or so. Why is that?

IF NOT PISA

5. About 2008/2009, MINT started to become a buzzword in education circles, the press, annual reports... Why is that?

- a. What spurred the interest in MINT?*
 - i. Why not something like adolescent reading instead?*
 - ii. How does MINT fit in with other initiatives corporations are funding in education?*
 - iii. How does MINT education fit in with vocational education training efforts? Is it related?*
 - iv. What were the major influencers in many corporations deciding to fund MINT initiatives?*
 - v. International ideas (OECD)/ European Union- Lisbon agreement?*

- vi. National ideas- education and philanthropy (i.e., venture/strategic)
 - vii. Specific reports or organizations
 - viii. Skill shortages, concerns re: international competition and innovation
 - ix. Companies- any major companies leading the way in this areaBMBF projects?
 - x. Anything else?
- b. There has been a strong push in recent years for corporate philanthropy to be strategically aligned to the work of the company to improve the company's competitive advantage, do you see MINT as fulfilling this?
- o Where does this push come from?
6. ***How did the acronym "MINT" help or hinder the way groups of actors worked on education issues?***
- a. *Which groups came together that did not typically work together?*
 - b. *How did corporate philanthropy work with ministries/unions/politicians?*
 - c. *Any groups that opposed the MINT movement? Who? Why?*
7. ***What types of MINT initiatives are being funded by corporate philanthropy?***
- Teacher training? How exactly?
 - Curricular materials?
 - Student activities?
 - Research about needs in MINT?
 - Meetings/forums to discuss MINT
 - Policy activities?
 - Non-profit organizations or directly to schools? Which type of NPOs?

What strategies did corporate philanthropy use to make MINT a major policy issue? (institutional entrepreneurs)

8. ***Would you consider corporate philanthropic actors to be at the forefront of the MINT movement? If not, which groups are?***
9. ***In your opinion, are corporate actors doing a decent job of bringing awareness of deficiencies in MINT education to the government?***
- *Are there any MINT initiatives that are now at least partially state-financed that corporate philanthropy was promoting? Which?*
10. ***Anything else you think I should know about:***
- *MINT movement*
 - *Corporate Philanthropy?*

Appendix E: Interview Questions U.S.

Before Start:

- STEM has become a huge buzzword in **K-12**⁸⁰ education and economic circles in the U.S. while in Germany it is MINT. Many major corporations and business organizations are playing lead roles in the STEM movement through their philanthropic contributions and by lending their voices to the movement. Likewise, there are many organizations that support MINT education at the local, state, and federal levels in Germany.
- Although there is significant corporate philanthropic interest and involvement in STEM/MINT education in both countries, there is a lack of research about it.
- Looking at this through American eyes where the German system with its well-known vocational system is forever touted as the way to avoid skill shortages and mismatches, I cannot help but ask my main research question: ***Why and how did corporate philanthropy in Germany and the U.S. become active in similar MINT and STEM initiatives even though their education systems are quite different?***
- *I spent the last few months researching the history of corporate philanthropy and involvement in education since 1945 but I am conducting interviews to learn more about recent movements in corporate involvement in education with a focus on MINT/STEM.*
- Anonymous
- Recorded only with your permission and for my use only for transcription
- Happy to share my research

United States

General Questions:

- C) How would you and your firm define corporate philanthropy?**
- D) Why is K-12 education and important investment field for corporate philanthropy?**

Was there a critical juncture for corporate involvement in K-12 education after NCLB? (Critical juncture and gradual transformation)

- 4. How has Corporate Philanthropy developed or changed among America's largest companies over the last 25 years?**
 - a. *Please compare for me the role of corporate philanthropy in education in the 1990s versus the time since 2000. There seems to be major growth in CP as evidenced by the founding of Corporate Foundations.*
 - i. *Move towards more strategic philanthropy*
 - ii. *A need to be more tied to corporate strategy overall*
 - iii. *Growth and professionalization of the sector?*
 - iv. *Other*
 - b. *What do you see as the major drivers of change in corporate philanthropy generally since the 1990s?*
 - c. *What about in the area of elementary and secondary education?*
 - i. *How did the approach that corporate philanthropy took in education change? (funding schools, NPOs, awareness, increase in K-12/ decrease higher education?) Were these*

⁸⁰ K-12 Education refers to elementary and secondary education (kindergarten through grade 12)

approaches in addition to their traditional funding priorities or did they replace them?

ii. What were the major influences for these changes?

- 1. Change in political make-up*
- 2. Concerns about high school dropouts*
- 3. Achievement gap concerns*
- 4. Availability of data on schools/failing schools awareness*
- 5. Not enough skilled workers*
- 6. Other*

5. IF NCLB/school results mentioned

a. When did this time of big awareness and focus on school results start and end?

b. How did this change the way companies approached or funded education?

i. What was funded (schools, NPOs, random, political)

ii. Philanthropic approach (actively engaged, high impact, work together)

c. Did NCLB change the alliances of groups working in education?

d. Corporate philanthropy had been active in education long before NCLB, which education initiatives was corporate philanthropy interested in investing in the late 1990s/early 2000s? (contingency)

6. What about Vocational Education initiatives? Was there interest in the early 2000s among corporate philanthropy in investing in career and technical education programs?

a. Has there been an increase in corporate philanthropic giving to vocational education programs (example: PTech, Cisco's Programming schools) over the last decade?

b. Why has there been an increase in giving to vocational education initiatives?

4. Tell me about the immediate years after NCLB was passed. How did corporate philanthropy become involved or change the way they were involved in education?

c. What were they funding?

d. How were they working together?

How and when did the idea for STEM education come into play? (ideational theory, gradual transformation, and discursive strategies)

IF NCLB

In the initial years following the passage of NCLB, there was no mention of STEM education in annual reports, the press... the interest in STEM did not really come into play until 2009 or so. Why is that?

IF NOT NCLB

7. About 2008/2009, STEM started to become a buzzword in education circles, the press, annual reports... Why is that?

a. What spurred the interest in STEM?

i. Why not something like adolescent reading instead?

ii. How does STEM fit in with other initiatives corporations are funding in education?

iii. How does STEM education fit in with vocational education training efforts? Is it related?

- iv. What were the major influencers in many corporations deciding to fund STEM initiatives?
 - v. International ideas (OECD)/ TIMSS/other)?
 - vi. National ideas- education and philanthropy (i.e., venture/strategic)
 - vii. Specific reports or organizations
 - viii. Skill shortages, concerns re: international competition and innovation
 - ix. Companies- any major companies leading the way in this area
 - x. U.S. Department of Education projects?
 - xi. Anything else?
- b. There has been a strong push in recent years for corporate philanthropy to be strategically aligned to the work of the company to improve the company's competitive advantage, do you see STEM as fulfilling this?
 - o Where does this push come from?
- 8. ***How did the acronym "STEM" help or hinder the way groups of actors worked on education issues?***
 - a. *Which groups came together that did not typically work together?*
 - b. *How did corporate philanthropy work with education agencies/unions/politicians?*
 - c. *Any groups that opposed the STEM movement? Who? Why?*
- 7. ***What types of STEM initiatives are being funded by corporate philanthropy?***
 - Teacher training? How exactly?
 - Curricular materials?
 - Student activities?
 - Research about needs in STEM?
 - Meetings/forums to discuss STEM
 - Policy activities?
 - Non-profit organizations or directly to schools? Which type of NPOs?

What strategies did corporate philanthropy use to make STEM a major policy issue? (institutional entrepreneurs)

- 8. ***Would you consider corporate philanthropic actors to be at the forefront of the STEM movement? If not, which groups are?***
- 9. ***In your opinion, are corporate actors doing a decent job of bringing awareness of deficiencies in STEM education to policymakers?***
 - *Are there any STEM initiatives that corporate philanthropy brought to the forefront but have been adopted by federal or state-level governments? Which?*
- 10. ***Anything else you think I should know about:***
 - *STEM movement*
 - *Corporate Philanthropy?*